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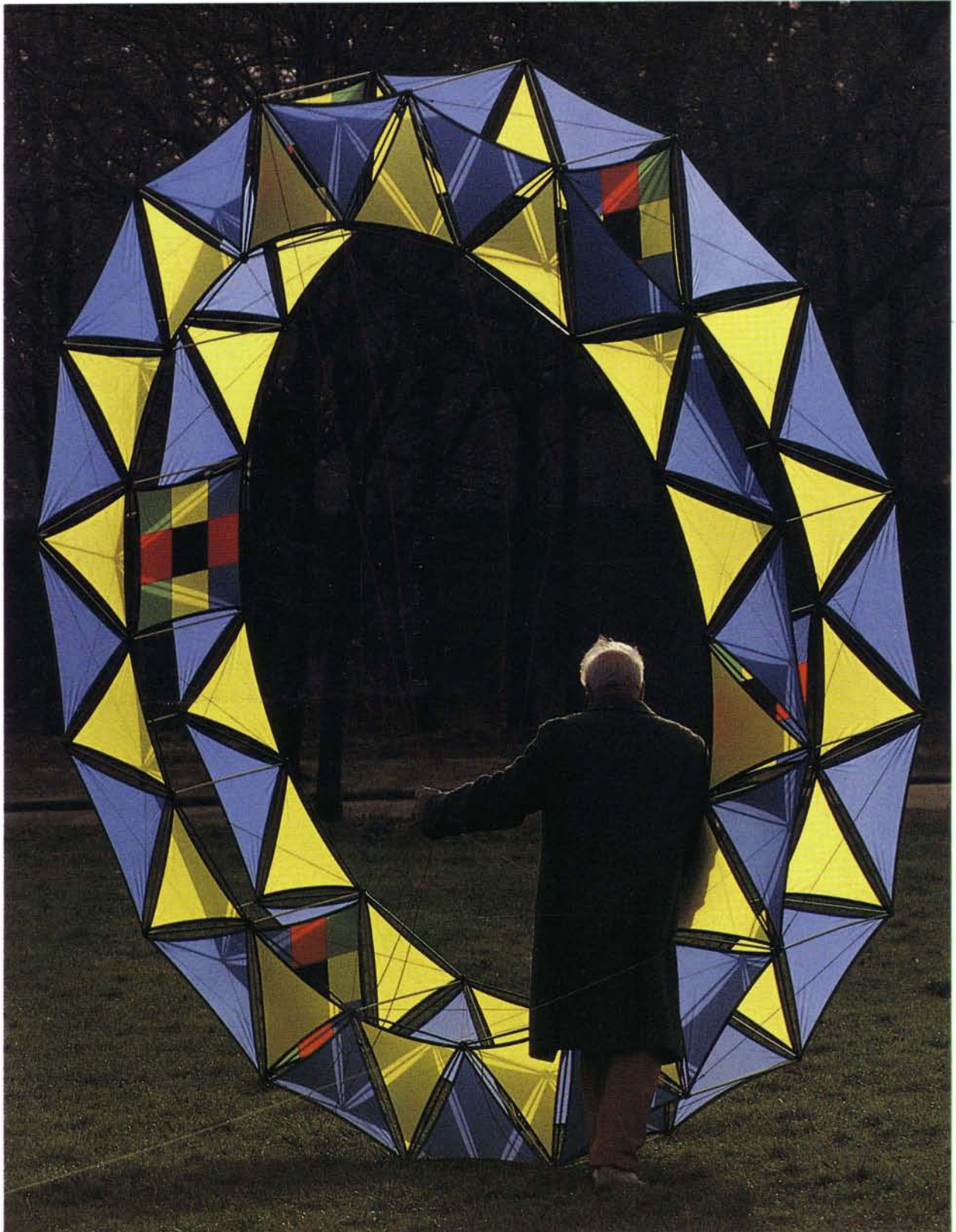
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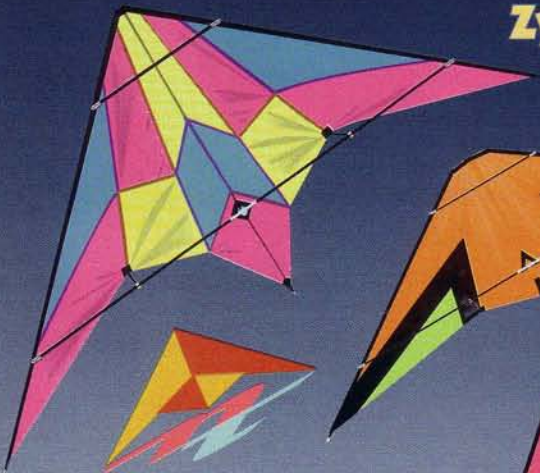
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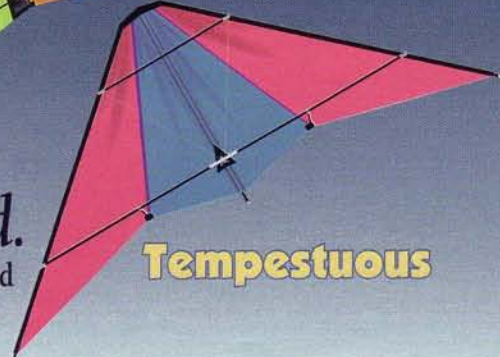
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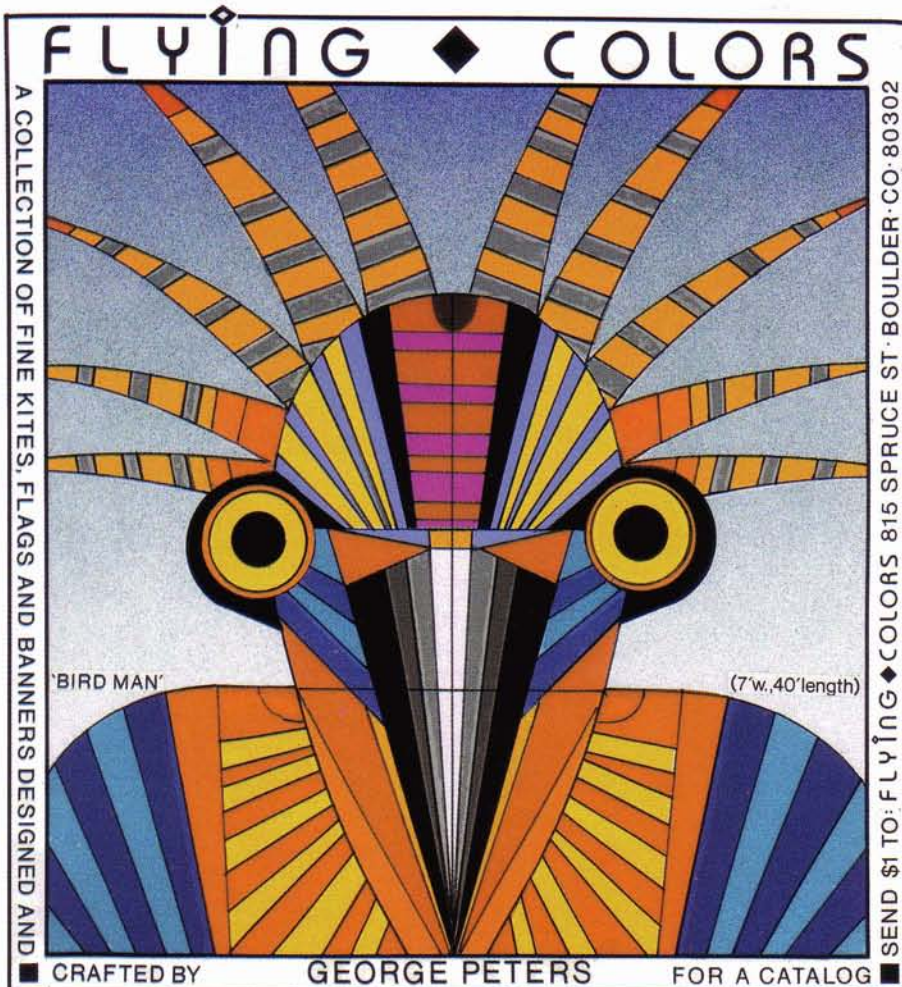
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Kite Lines

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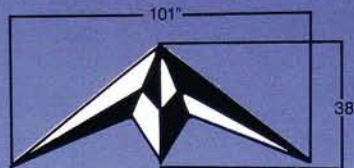
Contributions of information, articles and photographs are always invited. Submitted material must be accompanied by a self-addressed envelope with adequate postage. *Kite Lines* is not responsible for unsolicited material. Writers and photographers should request guidelines before submitting. Accuracy of contents is the responsibility of individual contributors. Diverse views presented in *Kite Lines* are not necessarily those of the editor, staff or advisory panels.

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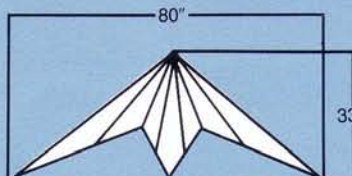
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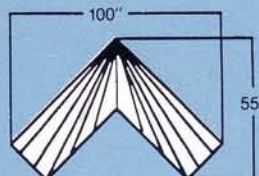
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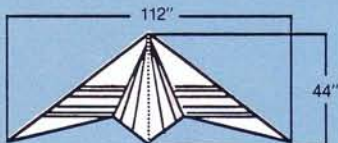


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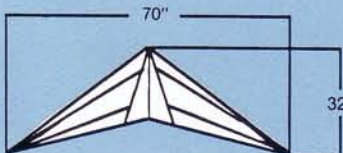
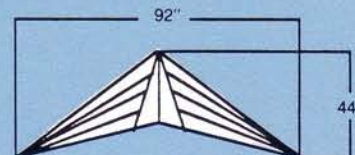
SUPER SKY DART

This redesign of our standard SKY DART is available in two stunning patterns. Outstanding mobility and fast, sharp turns make this kite an impressive and stylish flier.



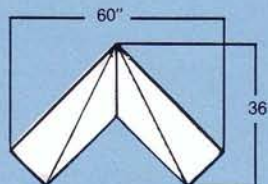
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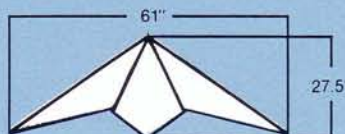
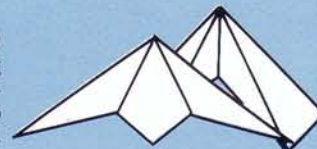


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Kitelines



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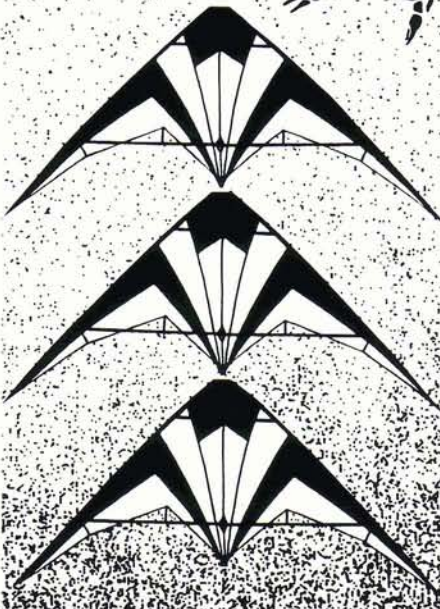
Cover

André Cassagnes of Vitry-sur-Seine, France with one of his ring kites, the beautiful and technically remarkable "Couronne (Crown) André Cassagnes" (CAC). These three-dimensional kites measure up to 13 feet (4 meters) in diameter. Some fly facing the wind, some fly flat. Photograph by Pierre Fabre. (Story, page 34.)

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How to Use Our Kite Research Library

In the course of work here at *Kite Lines*, we inevitably collect kite books, videos and publications from all over the world.

When we moved some time ago, we discovered that our collection just would not fit onto our old shelves anymore. We had to buy (yegods) four large new bookcases. Now we have room for our many treasures, which we believe may constitute the best kite library in the world.

We have original volumes of Woglom's *Parakites* (1896), Marvin's *The Mechanics and Equilibrium of Kites* (1897), Garber's Boy Scout kite manual (1931), Choe Sang-Su's *The Survey of Korean Kites* (1958), great old *Scientific American* magazines and the famous May 4, 1962 *Life* magazine with Will Yolen's article, "How I Got So High on Kites," as well as oddities and foreign books in numerous languages.

The books are not only tidier now but more accessible. We have chairs, a table, a VCR and a photocopier nearby, and our Library is open for research. It serves *Kite Lines*, of course, but it is available to subscribers as well.

We have been providing services like this since 1977, and we can't seem to keep ourselves from it, even though doing so is a burden that weighs down the magazine.

Meantime, we will continue to use this Library and our other files to bring you the best-researched kite publication available. And I guess we will keep answering all the letters and phone calls that cross our desk in a steady stream, covering everything from patent researches to world records to the latest one about the FAA regulations.

Would you believe: although the regs are printed and freely obtainable from *Kite Lines*, the problem seems to be that many bewildered kitefliers, certain other publishers and even a few local offices of the FAA itself *don't understand them*. The regs are hard to read, but our friend Theodore Edward O'Bear waded through them and came up with the text in the box.

We hope you will come visit us and use our Research Library. But if you can't come by, we hope that in your requests for help you will be sensitive to our limited capacity for providing personalized

research. Please don't let us be too generous for our own good. We have a magazine to put out. And we have to be able to buy new bookcases from time to time.

Valerie

In an effort to cut through the bureaucratic gobbledygook, here is a drastic condensation of the FAA rules on kiteflying:

No person may fly a kite weighing more than five pounds. . .

- more than 150 feet above the ground without notifying the FAA in advance,
- more than 500 feet above the ground,
- within 500 feet of a cloud,
- within five miles of an airport,
- where visibility is less than three miles,
- in a restricted or prohibited area without permission,
- between sunrise and sunset unless the line is equipped with pennants or streamers,
- between sunset and sunrise unless the kite and line are equipped with lights.

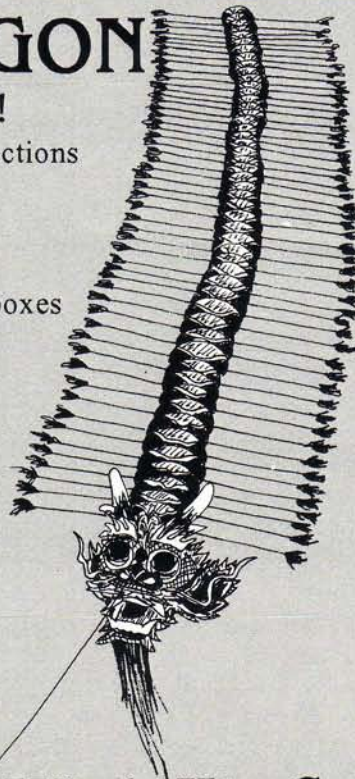
No person may fly *any* kite in a manner that creates a hazard to other persons or their property.

No person flying *any* kite may drop an object from it if such action creates a hazard to other persons or their property. —T.E.O.

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Best fringe benefit of the store: "All the great people we meet, and working together."

Favorite issue of *Kite Lines*: "The first one I read. It opened for us the wonderful world of kites."

Doesn't your store carry *Kite Lines*? To learn all the benefits of doing it, write for retailers information package: *Kite Lines*, P.O. Box 466, Randallstown, MD 21133. Or telephone us at 410/922-1212. Or fax us at 410/922-4262.



Letters

Less & More



More Than A Toy

My wife and I became friends with a boy who had been having troubles and was about to move away to live with other relatives. We had the boy visit us before he left. He became enraptured by my kites and he helped me give a workshop for Cub Scouts (using your reprint for making sled kites).

Despite my protest that I didn't have a good flying site in this valley, he nagged me to fly kites with him. So I got permission from a farmer with a hilltop hayfield and we had one of the best days of my life, flying almost from dawn to dusk. Conditions were absolutely perfect. The boy was able to fly all of my kites and he was especially taken with an old-fashioned barn-door kite, which I call Uncle Mac after the man who taught me to fly.

From his new home, the boy wrote a very happy letter. He is living next to a big flat soybean field. The farmer had given him permission to fly kites there. One relative had given him a subscription to *Kite Lines* as a going-away present; another had given him a stunt kite. The last thing he said in his letter was that his new kite was named Uncle Bill. As you can imagine, that reduced me to blubber.

I guess you've heard a lot of stories like this that show kites mean so much more than toys or technical devices.

—William G. Wing
Narrowsburg, New York, USA

Less Than A Jalbert?

Couldn't help but write after my *Kite Lines*' arrival yesterday. I had advance notice of Stretch's thing on a new kite that, at best, could be called a pair of wedges. ("The Painless Parafoil" by Hugh R. D. [Stretch] Tucker in the Winter 1991-92 issue.)

There is nothing in the design that would make this a parafoil. No human would jump it (para) and no airplane would fly it (foil). Check out your dictionary.

Myself, I show a lot more respect for the world's best design, "The Jalbert Parafoil," and that is what I build.

—George Ham
San Francisco, California, USA

Relax, George: just as every sled kite is not an Allison and every box kite is not a Hargrave and so on and so on, every parafoil is not a

& Edos Again

Jalbert. And we don't think Dom would mind. Thanks to you for keeping the original Jalbert light shining.

Edo-fax-dako?

I'd like to take a moment to tell you that your response to Makoto Ohashi left this language purist quite unhappy. Rather than start from the beginning, let me start by noting that your analogy between "Edo" and "fax" simply does not fly for several reasons.

Adding a verb tense to a word which only had a noun sense is quite different from modifying an existing verb sense. The adjective sense of "Edo" has a long history whereas even the noun sense of "fax" is quite new. "Fax" is being defined by a much larger community than the kite community whereas this particular sense of "Edo" is clearly kite-specific.

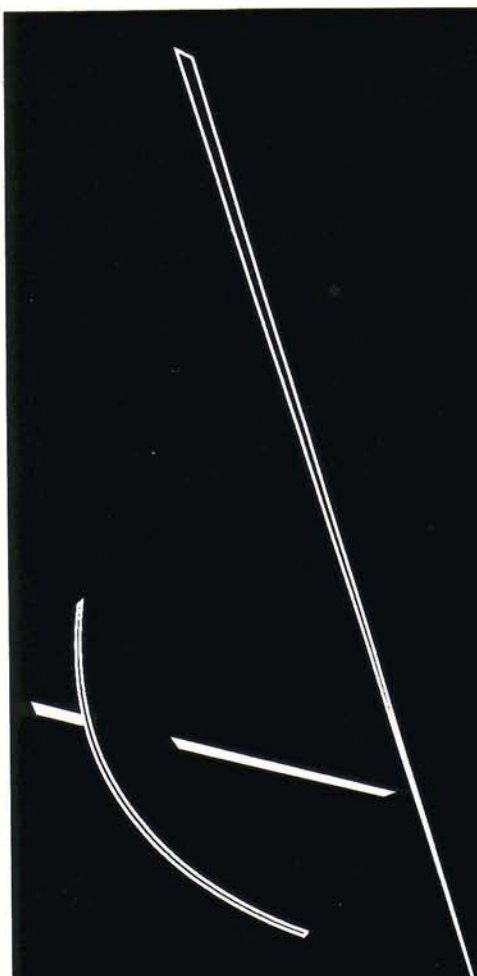
Just from your review of *Edo Dako Dai Zenshu*, one can clearly see that there are several kinds of Edo kites and that "kakudako" (or "kaku" as suggested by Ohashi) would be a more appropriate abbreviation. What is not clear is your suggestion that the redefinition should be regarded as a *fait accompli*, especially by the editors of the "quarterly journal of the worldwide kite community." (Perhaps you mean "Western kite community.")

Furthermore, nobody is suggesting that we "stamp out" the word "Edo." I believe Ohashi is merely suggesting that we stop trying to assign it meanings for which we already have words. *Kite Lines* could assume a leadership role in helping the kite community learn these "new" terms, e.g. by using descriptors like "(Edo) kakudako" during a transitional period. Please reconsider.

—Felix Yen
Baltimore, Maryland, USA

We'll gladly take your definitive word for it, Felix, and we humbly bow to Makoto Ohashi, too. We don't want any unhappy purists reading between our lines.

Write us a letter! Anything you write to *Kite Lines* may be considered for publication, so please mark it "not for publication" if you want no doubt to be left about it. Address to: *Kite Lines*, P.O. Box 466, Randallstown, MD 21133-0466, USA. Or fax us at 410-922-4262.



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- ★ Cap'n Nemos
- ★ F3F2
- ★ Four Dekker
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By Mel and Valerie Govig and the *Kite Lines* staff

Flip-Flop Rokkaku

An idea whose time has come, the Flip-Flop Rokkaku adds new giggles to the flying of these kites. The invention is not totally original, but it is the first time that the idea has been made available commercially.

Kevin Shannon (Carlisle Kiteworks) has added a short stiff rod (actually a tube) to the center of the bridle of a four foot rokkaku. The bridle ring slides up and down the rod. At one end of the rod the bridle point is right for the kite to fly that end up, and vice-versa. A simple idea, it is simply delightful.

To make the kite perform its acrobatic somersault, the flier gives a little slack to the flying line. This allows the bridle ring to slide down to the bottom of the rod. Then tension is reapplied, the kite does a 180-degree turn, and what was the bottom is now the top. The wind range for flip-flopping is limited (8-12 mph), but the kite flies minus flipping in a wider range (5-20 mph).

The kite can hang up occasionally, if the ends of the rod get hooked in a bridle line. As a result, the bridle ring is not free to slip down the rod. Even then, the kite flies normally as a rokkaku and can be pulled in for adjustment.

Except for the flip-flop mechanism and flip-flop graphics, this is a standard Carlisle Kiteworks rokkaku, which means that it is well thought-out, easy to assemble and fly, and made with quality materials and workmanship.

No-Flop Rokkaku

The Maurizio Angeletti rokkaku is a well made kite, joining a field of about four other rokkakus on the market. This classic design is, as Maurizio says, "one of the very best ever devised by any kite culture or tradition," and he cites the "undeniable beauty" of the kite's ability to conform to the wind.

The principal difference in this kite compared to other rokkakus is the excellent graphics by Maurizio. Our kite carried his favorite star motif in subtle tones of blue, purple and gray.

The kite is large and flies on very light winds. It can even be pulled up on winds of 2-3 mph. It develops considerable force in winds of 10 mph or more. Small people

and children should not handle the kite line alone.

We had one problem with Maurizio's rokkaku: we couldn't fly it first time out because the cross-spar ferrules had been driven into the graphite tubes in shipping. It was easy enough to fix, but we understand that future kites from Maurizio will be made without this problem.

One great virtue of this kite is its careful bridling, which translates into quick ascension out of the hand into the sky. It would surely perform well in a rokkaku challenge, but the sheer beauty of the kite gives rise to the question: would you risk such a lovely creature to the heat of battle? Or would you save it for times when you want a purely aesthetic experience?

Kissing Fish, Mother Fish

These kites by New Tech Sports have in common inflatable fish shapes attached alongside of the wooden longerons. However, the kites are semisoft and also have regular dowel stiffeners. The Kissing Fish is a small sled kite and the Mother Fish is a small delta.

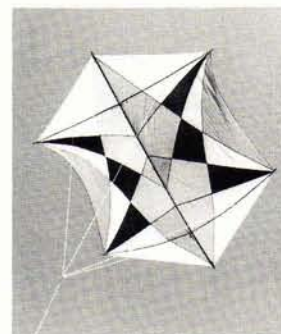
The Kissing Fish is well named because of its tendency, common to sled kites, to collapse and open up in the winds. When the sled does a quick collapse, the two fish appear to "kiss." The flight performance is about what one would expect from a two foot sled, but the visual effect is very upbeat. The bright colors and the three dimensional look, especially from the side, make it a very attractive kite.

The Mother Fish gave us some trouble until we softened the fabric in the inflatable spinal column. Small deltas tend to be skittish in turbulence, and the effective wind range is limited. Below 6 mph, the fish has trouble inflating, above 12 mph, the kite veers to one side or the other, like small deltas do. But the three dimensional effect is fun to watch, and on this kite it works from *all* angles. It might be called a poor man's Martin Lester kite.

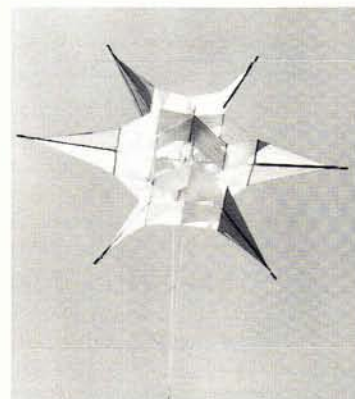
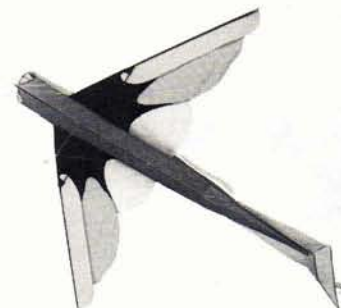
We are happy to see someone making reasonably priced kites for the fun of fliers, especially children. These kites are well sewn, although the workmanship is in keeping with their modest price.

Conic Kite

We didn't know why this was called a



From top:
Flip-Flop Rokkaku by Carlisle Kiteworks, Rokkaku by Maurizio Angeletti, Mother Fish and Kissing Fish by New Tech Sports and the Conic Kite by Professor Waldof.








"conic" kite at first, but were told that when the panels meet one another, if you connected those points it would be *conic*. In any case, conic it's not. A star it is.

We were somewhat disappointed in the kite as a structure. It seemed as if it

needed six more sticks, at the roots of the six wings. It has a "wrinkly" cover from lack of tensioners at these points. However, the slight ripples in the skin don't seem to effect its flying or its appearance in the air. At the Philadelphia Kite

Festival this year, the Conic Kite was entered as a demonstration of tumbling. It worked very well. There are a few tumblers out there, such as the Starflake and Asteroid from Goodwind's Kites in Seattle, Washington. Now there is another. ◇

DATA CHART

Name and Shape of Kite	Retail Price	Dimensions (inches)	Weight (ounces)	Major Components	Portability	Assembly Time	Durability	Wind Range	Ease of Launch	Skill Level
Carlisle Kiteworks: Flip-Flop Rokkaku 	68.00	40x46	7.0	ripstop, graphite, fiberglass	VG	3 min.	E	8-12	E	I
Maurizio Angeletti: Rokkaku 	210.00	65x80	16.5	ripstop, graphite	VG	4 min.	E	6-20	E	I
New Tech Sports: Mother Fish 	39.90	62x36	5.25	ripstop, dowel	VG	1 min.	G	6-15	G	N
New Tech Sports: Kissing Fish 	19.90	34x24	3.25	ripstop, fiberglass	VG	1 min.	G	6-15	E	N
Professor Waldof: Conic Kite 	100.00	56x30	11.00	ripstop, fiberglass	VG	5 min.	E	8-22	G	I

NOTE: Retail price (in US dollars) is "advertised" or "suggested." Wind range (in mph) covers minimum and maximum speeds deemed suitable by our evaluators. Skill levels: N—Novice, I—Intermediate, S—Skilled. Other ratings: P—Poor, F—Fair, G—Good, VG—Very Good, E—Excellent. Dimensions are in the following order: width x height. Measurements and drawings are made with the kite standing up on the floor facing the viewer.

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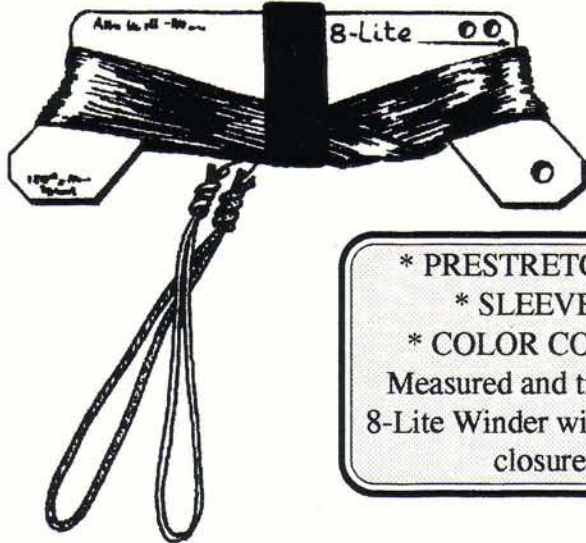
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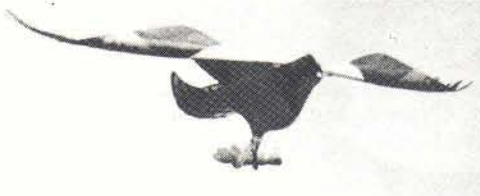
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The Political, the Pretty and the Premature

By Maurizio Angeletti, Valerie Govig and Mel Govig

A Context for Kiting

Drachenreise (Kite Journey) by Ruedi Epple-Gass (Switzerland: Zytglogge Verlag, 1991), in German, softcover, 125 pages, 29 Swiss francs.

Drachenreise is a unique book in many regards and just for this reason it would surely deserve an English translation.

At a time when kite books are better produced from a technical standpoint—glossy paper, flashy color pictures, “comprehensive” but superficial descriptions and emphasis on kite construction—this book takes just the opposite path.

In many ways it reminds me of another generation of kite books, the many written in the '60s and '70s, with a lot of black and white pictures, sometimes out of focus or not particularly artistic, with uncertain kite plans, lots of history and lore.

Drachenreise carries out some of this book tradition, in the format, the background and the intentions of its author. It's a book that will surely be boring to some, unappealing to others and disturbing even to those who read it with some interest.

Its title, *Drachenreise*, is a definition of intent: this is a *kite journey*, and through it the author wishes to lead readers into several countries of the world, all having kites as a common denominator.

Although most of these countries are non-European, they're not the usual ones we would immediately think of (Japan, China and so on). Rather they are underdeveloped areas of the world such as the Philippines, Dominican Republic, Turkey, Santa Cruz, Vietnam and pockets of Latin America.

While kites are a steady element throughout the book, the author's main theme is actually what these countries share: political instability, dictatorship, exploitation of raw materials on behalf of the western industrialized world, and poverty of the majority of the population.

This is a book that offers us a few kite plans, but at the same time makes us feel almost guilty for the way we high-tech enthusiasts fly kites and the way our kite culture has been developing.

Ruedi Epple-Gass assembled this work comprehensively, researching it over a long period of time. He's traveled to some of these

lands, and for those where he hasn't he has provided information through meeting people, reading, collecting numberless scraps from numberless sources and piecing them together. So this is a serious work, not improvised overnight or copied from elsewhere.

The kite plans have an old fashioned feel (mostly flat or bowed kites, hexagons, Eddys, fishing kites, etc.) but this has to be seen—and accepted—in light of the above.

The book clearly pictures Epple-Gass's personal philosophy of kites, especially in the

have objected to it because, in spite of its title, kites are marginal to the contents, and this is more a book about politics and the relationship between the third world and our western world.

I suppose this is true, but I don't think it hurts any kiter to know about these places and to have a deeper awareness of what kites mean in these contexts.

As I said in writing the foreword to this book, I also believe that kites can't do much to solve directly any of the problems analyzed, yet they are a beautiful and effective way to convey positive values. Kiteflying in itself does this, anytime, anywhere, without need for explicit, noisy, empty slogans.

Whatever the reaction and acceptance of it, this is an original book that should surely be in any complete kite library. —M.A.

Ultimate—NOT

The Ultimate Kite Book by Paul and Helene Morgan (New York: Simon & Schuster, 1992), hardcover, 80 pages, \$19.95.

With so many beautiful kites on the market, a kite book can be mainly illustrated with them and look great, as this book proves. It is one of the most attractive new kite books we have seen, judging simply on appearance. The large format and lavish color throughout should make it popular and especially good for children, although it will interest adults as well.

The book chapters take turns with history, types of kites, flying and kitemaking. There is an index (yea!) and a suppliers list (short and out-of-

date, boo!) Substantive matters like history are cut out in favor of visual elements, an increasingly common strategy in our sound-bite society. For example, the section devoted to materials and tools is not content to list them; it has to show every size and type of strut, fabric, line, accessory—everything you'd ever need, in unbelievably pristine condition—even scissors. This is a rebus, really, suited to kindergarten.

A veritable army of designers and “project editors” was involved in producing this book, but the information and kite plans were the responsibility of the Morgans. Fortunately, they were an informed source for the most



A street child, flying a kite in Brazil.
Photo by Jorge Deustua from *Drachenreise*.

book's last chapter, about Switzerland. All the implications of money laundering through Swiss banks are involuntarily connected with the contemporary Swiss kite scene. Here kites are mostly an expensive sport item rather than an object for cultural and artistic flights.

Epple-Gass misses another world of kitefliers, a world of sharing plans and information, a world where meetings are preferred to big festivals and contests, a world where the admission price is very low and the main thing is to fly for pleasure and to enjoy the social relationships that kites create.

Some people who have read the book

Summer
and



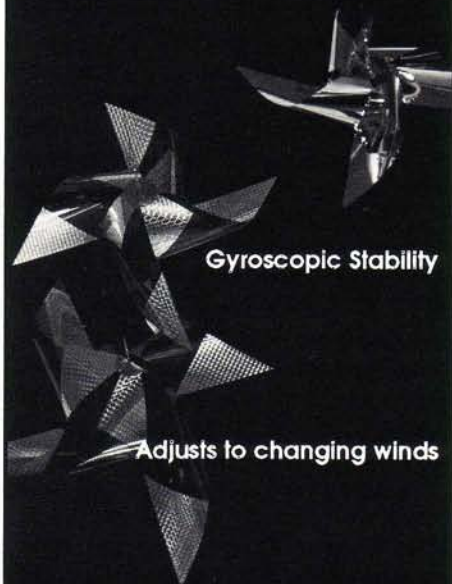
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part. This book has fewer errors than most. We did see a Professor "Waldorf," line tension omitted from "How a Kite Flies," and a strange blend of "nylon/polyester" fibers for line, as well as a few other minor errors.

However, the book's real shortcomings are errors of omission rather than commission. How in the world could a Legs kite be photographed without credit to its maker Martin Lester? Or the Tako-Tako and Tri-D box without credit to Peter Lynn, or the Fish Delta without credit to Joel Scholz? (Yet Dan Leigh is named with his delta. You figure.) At the end of the book there is a cheap three-line thank-you to a dozen distinguished kite designers. The Morgans should show more gratitude in print.

At least the faults are counterbalanced by positive attributes. The book is up-to-the-minute, clearly laid out and full of helpful tips. The kite plans (including sled, Della Porta rectangle, six-cell soft kite, tumbling star and stunter) appear to be very well done. I found the section on flying unusual because every step is shown with silhouetted photos, rather obviously studio shots, but nevertheless a brave effort to show things that are almost unshowable.

This book all but shouts "Introduction" all over it. The Morgans themselves say that was what they intended it to be. As such it is a success. And that is why there was one thing about it that we could not stomach: the title. No way is this the "ultimate" kite book! We were sure it was not the Morgans' idea. We asked them and found that, sure enough, it was the brainstorm of the marketing department of the U.S. publisher. (The British edition is titled simply *The Kite Book*.)

If you can get past the title, you'll probably enjoy this book. Here at *Kite Lines* we call it the UKB. It just hurts our mouths to speak the actual name out loud. —V.G.

Fighter Without Soul

The Fighter Kite Book! by David Gomberg (Salem, Oregon: Cascade Kites, 1992), paperback, 74 pages, \$8.95.

Jimmy Lambrakis printed an excellent little four-page guide for the Grandmaster in the early '80s which is inserted with the kites to this day. Mahfuz Ali Khan wrote a pithy eight-page book distributed by the Bahadurs in the '60s to encourage people to fly Indian fighters. Dinesh Bahadur published a nice paperback in 1979 that gave the flavor of one-line maneuverables, with less practical guidance. Vic Heredia used one sheet of paper to tell people how to fly Vic's fighter kites. All of these writings were help-

ful for the novice fighter flier. Leland Toy, Will Yolen and I have all written articles and book chapters on the mysteries of fighter kites, with clues to solving the mysteries. The wheat of what all of us said is in David's book. You have to work to winnow it out from the chaff, but it's there.

How much chaff? Nearly every page contains spelling, grammar or punctuation errors that undermine the credibility of the book. The illustrations of bridles are almost universally wrong. Information is missing for some subjects (bridling) and repetitious for others (safety). The physical format of the book, homemade and proud of it, is like David's previous effort, *Stunt Kites!*, except the drawings are better.

Books traditionally differ from magazines and newspapers, which have space and time limitations. Books are the place for careful preparation. But this book appears hurried into print to hit the "season."

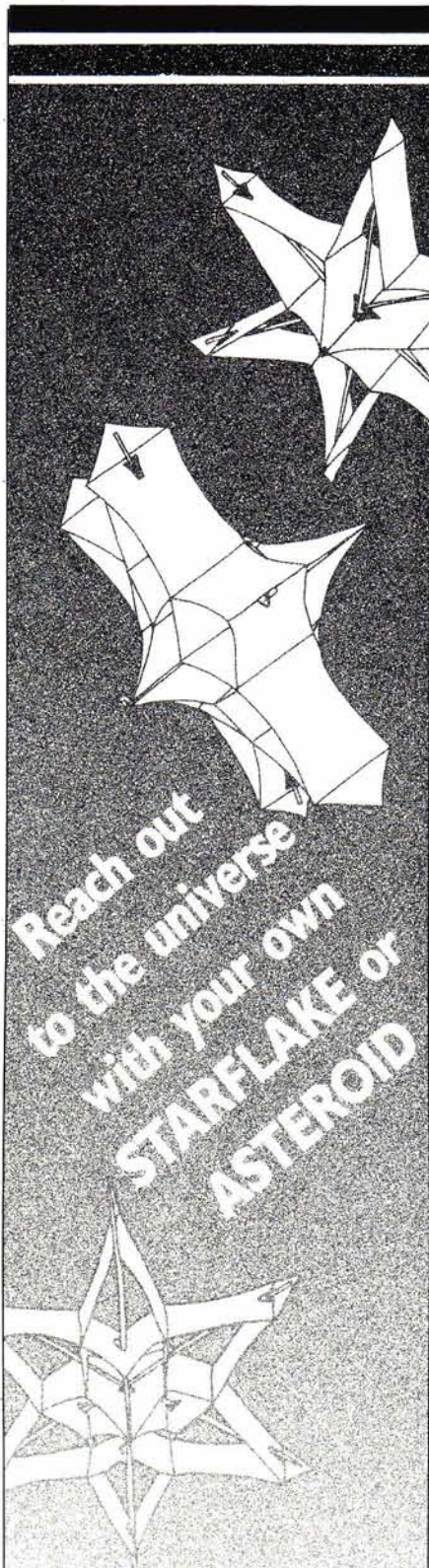
A questionable feature is the quotations from 22 people scattered through the pages. These words are some of the best in the book. But they are used in a ruthless vacuum-cleaner style. The kicker is that Gomberg has printed all these names on his title page, making them look like endorsements! Some of us ended up less than flattered to be associated unwittingly in such a way with this uninviting, even embarrassing book.

The chapter on contests starts with a quote from me that shows my disdain for rules. Considering the great fighter kite traditions (India, Korea, Japan, Thailand, et al) going back scores, even hundreds of years, isn't it pompous of Americans to elevate our little games to the status of ritual? I don't mind spontaneous competition on the field. I do object to rules that limit the range and imagination of the fliers.

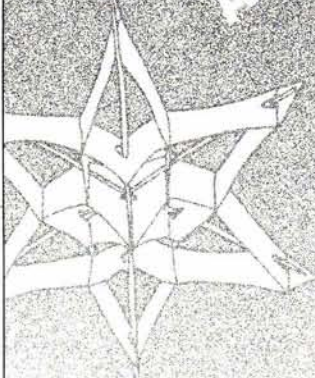
What this book needs most is soul. I know and like Dave Gomberg and respect him as current president of the AKA. I know for a fact that he flies fighter kites. In person, he talks about them with enthusiasm. Yet none of that feeling comes across in his book. Its other flaws would be forgivable if only the book conveyed enthusiasm.

There is something to be said for collecting information on a subject if public interest is strong and original sources are scattered. Gomberg's facts and intent are good. Only the execution fails.

Gomberg evidently meant to publish the definitive book on fighter kites. He didn't. I wish he had heard my advice when I saw the first draft: Get an editor (or at least a proofreader), and let this work mature. —M.G.



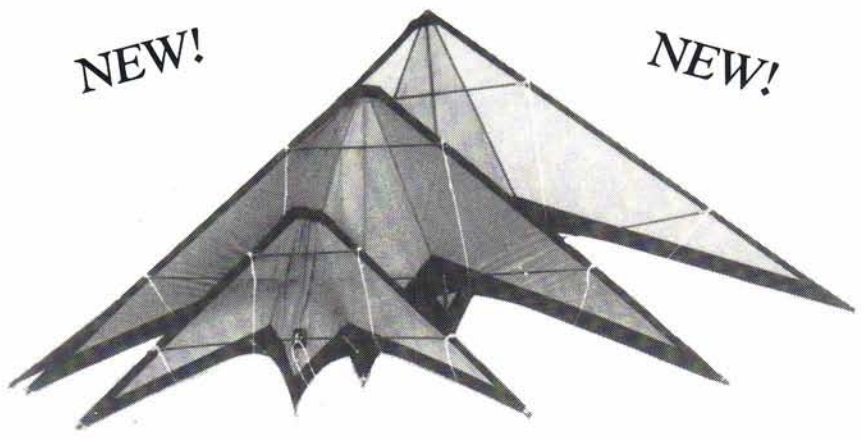
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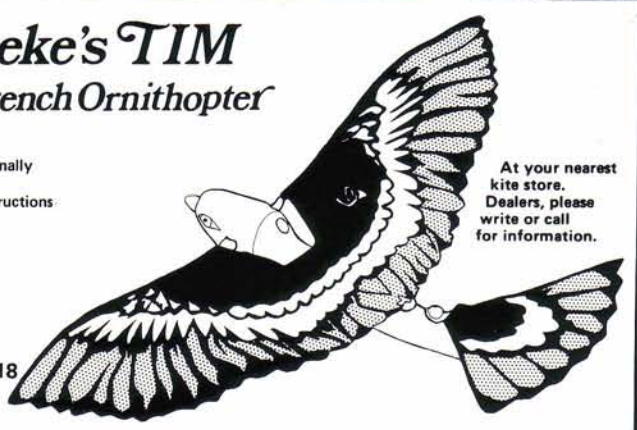
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The Anytime Valentine

By Shannon McGinnis

After seeing a picture of Hungarian Heart kites in *Kite Lines* (Spring 1988, page 82), I became intrigued by the idea of making a heart-shaped kite.

I contacted *Kite Lines* to see if any of the available kite books had plans for a heart-shaped kite. No plans were found, but more information on the Hungarian Heart's origin appeared in the Winter 1988-1989 issue of *Kite Lines* (page 30). I continued to experiment with various ideas and came up with the following plans for what could be a Valentine kite—anytime of the year. This design could be made in other sizes and materials. This is a novel kite for gentle breezes. It rises quickly and pulls gently on the line. Decoration is part of the fun, since Valentine messages can easily be written on the cover with markers.

Tools

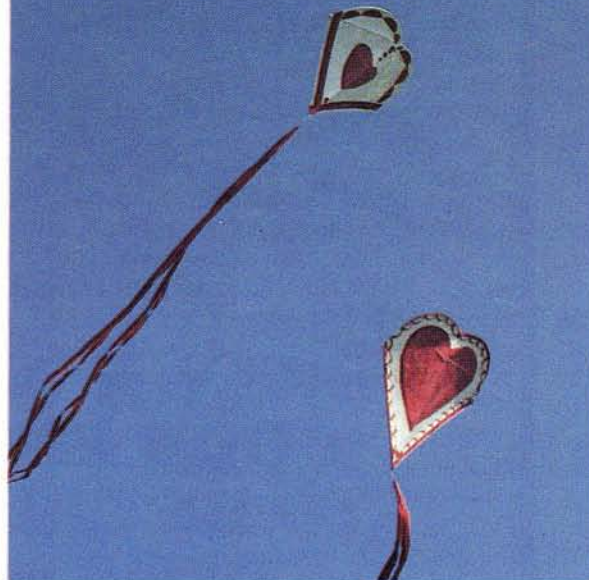
- yardstick or meter stick
- hobby knife or razor
- pencil sharpener
- scissors
- white glue or rubber cement
- cyanoacrylate ("Super Glue")

Caution: Be very careful when using cyanoacrylate glue. It can stick your fingers together in a second and the fumes can be extremely irritating.

Materials

- 2 fiberglass rods, $\frac{1}{2}$ " x 48"
- 1 wooden dowel, $\frac{1}{4}$ " x 36"
- 1 piece Tyvek, 39" x 39"
- vinyl tubing, $\frac{1}{4}$ " inner diameter, one piece about 1" will be enough
- vinyl tubing, $\frac{3}{8}$ " inner diameter, two pieces, each about 2" long
- 1 arrow nock (.261/.298") for end of wooden dowel
- 4 end caps, $\frac{3}{2}$ " for fiberglass rods
- 3 small split rings, about $\frac{3}{8}$ " (1cm) diameter for bridle and tails
- 1 roll surveyor's tape for tail
- filament or strapping tape
- lightweight (20- or 30-lb) line

Options: markers (permanent ink) and/or ripstop nylon repair tape, also known as "Crack-N-Peel"



The Spine

To make the spine, use a 36" (91cm) wooden dowel. You may cut it shorter depending on the shape of the heart you find most pleasing. The shortest spine I've tested is 30" (76cm).

Sharpen the bottom end of the spine with a pencil sharpener. The arrow nock will fit on this point later.

Cut two retaining rings from the $\frac{1}{4}$ " vinyl tubing, making each ring about $\frac{1}{8}$ " (4mm) wide. Then push a retaining ring on each end of the spine. At the top, the ring should be almost flush with the end of the spine. At the bottom, the ring should be about $\frac{3}{4}$ " (2cm) up from the bottom. If the rings are not tight, glue them in place.

Glue the arrow nock in place on the bottom of the spine to receive the framing string later.

The Bows

Glue the four vinyl end caps to the two fiberglass rods, one cap on each end. This will prevent splinters and make it easier to work with the rods. Mark each fiberglass rod at 21 $\frac{1}{2}$ " (54.5cm) from one end to show where the rods will intersect.

Lash the rods together to form an "X" with the shorter legs (21 $\frac{1}{2}$ " or 54.5cm) down. Use filament tape which you have split into thin $\frac{1}{8}$ " (5mm) strips. The 26 $\frac{1}{2}$ " (67.3cm) lengths of upper legs will be bowed over to make the rounded tops of the heart.

Connect the ends of the upper legs of the "X" to the ends of the lower legs. The legs can be fastened together with thin strips of filament tape, but a neater connection can be made using vinyl tubing. Insert the ends of the top and bottom legs into this tubing past the end caps (Figure 1).

Then lash the joined fiberglass rods securely to the center spine just under the retaining ring. Use filament tape here also. The arrow nock should be down and turned so it can be used as a notch for the framing string.

The Framing String

Attach a length of flying line to one side of the heart where the fiberglass rods are joined at the wing tips, run it down through the arrow nock, and up to the other wing tip. Secure it with good knots and a dab of glue, if desired.

Check to see that both sides of the heart match. Slide the string back and forth through the arrow nock until symmetry is attained, then wrap a thin strip of filament tape around the nock to secure the string and prevent it from slipping.

The Sail

Place a piece of Tyvek under the frame and trace a piece around it, marking a $\frac{3}{8}$ " (2cm) hem to overlap. Cut out the sail and fold it in half to check for symmetry.

Crease the hems that will fold over the framing strings. A fingernail will do.

Decorate the sail *before* you glue it to the frame. Use markers and/or ripstop nylon tape. To intensify the color, apply the marker to both sides of the sail.

After the sail has been decorated, place the frame on it with the fiberglass rods next to the Tyvek.

Tuck the framing string in the hem creases and glue in place with white glue or rubber cement. Clip the curved upper hems so they will form a smooth curve when the hem is folded over and glued in place (Figure 2).

The Bridle

Bridle the heart with a length of line about 1 $\frac{1}{2}$ times the length of the spine.

For a 36" spine, the bridle should be at least 54" long.

Attach the lower leg to the bottom of the spine below the vinyl retaining ring. Attach the upper leg one-fifth of the way down the spine (about 6-7").

Hold the kite up to the wind with a finger loosely around the bridle and let the kite seek its own flying point. Attach a split ring to the bridle with a lark's head knot at the towing point.

If the towing point is set too high, the kite will soar and overfly; too low and the kite will not climb well. During flight, careful maintenance of line tension will allow the kite to rise and then sink just enough to prevent the kite from overflying and coming down the line at the flier.

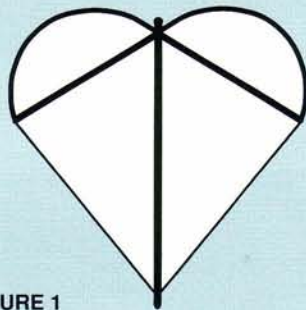


FIGURE 1

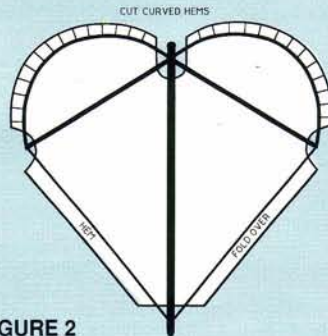


FIGURE 2



FIGURE 3

DRAWINGS NOT TO SCALE

The Tail

This heart needs a long tail to fly well. Start by placing a swivel snap on one split ring. Tie another split ring to the spine above the retaining ring to make a tail attachment point.

To make the tail, cut two or three strips of surveyor's tape at least 8 yards (meters) long. Run the strips of plastic through the split ring to the halfway point (4 yards). Use filament tape to hold the strips in place (Figure 3).

The Flight

When light breezes arise, let these Valentines tug at your heart strings as well as your kite strings. You will love them as they leap eagerly skyward, lifting your spirits with them. ◇

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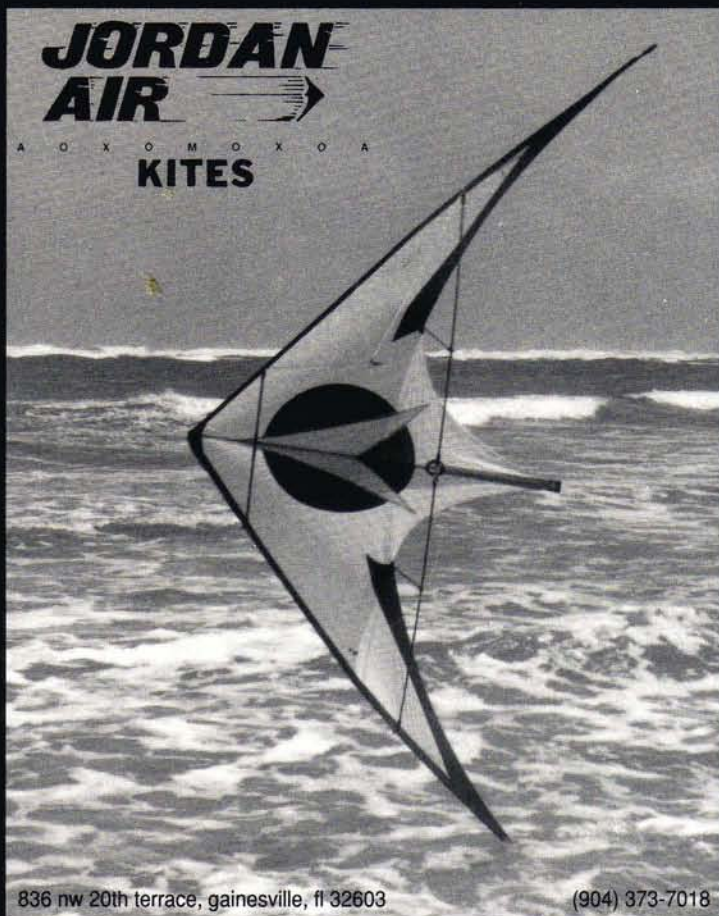
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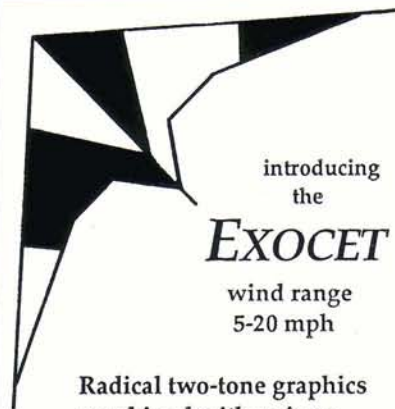
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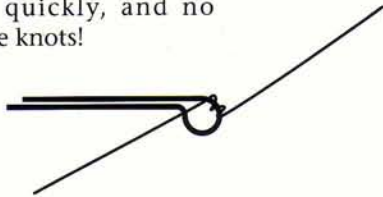
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Cotter, Dropper, Flip-Flopper

1 THE KEY TO EASY LINE ADJUSTMENT

From Steve Lamb, *Catch the Wind*, Lincoln City, Oregon:

Steve suggests the use of a simple cotter pin to make fine bridle adjustments on multibridle kites, such as stunters or trains. Cotter pins are used for fastening wheels and rollers to shafts and are available at hardware stores. The open end of the cotter pin is easy to slip a loop of line through. By taking successive loops through the pin, a line can be adjusted an eighth of an inch at a time. If the winds change, just undo a few loops or add a few. Fine tuning quickly, and no more knots!



2 A DANDY CANDY DROPPER

From Mel Govig, *Baltimore, Maryland*:

For the 1991 Maryland Kite Festival we advertised both a candy drop and an egg drop, neither of which we had ever done before!

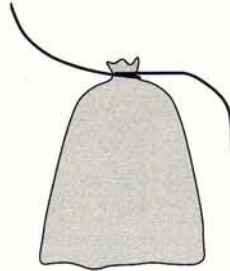
That's all right, I had seen it done a couple of years ago at Long Beach, Washington, by Art Ross of Canada and several years ago at Fort McHenry in Maryland by Ed Spencer of New Jersey. In both instances the drops included several abortive attempts before the final dramatic sky dump worked. I can live with that! Let the crowd get a little impatient—it heightens the drama.

Dry Run

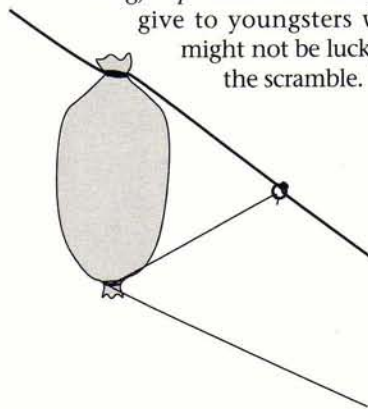
Not wanting to fail totally, we did a dry run in the kitchen, and it worked the first time—a sure sign that it would fail at least once on the field.

In our kitchen test, we sealed the container (a plastic trash bag) with masking tape after folding and gathering in about an inch of the open end. We cut the masking tape with a length of linen flying line. It worked in the kitchen, but on the flying field, the plastic bag jammed between the string and tape, and broke the linen cord without cutting the tape.

Bill Bigge suggested light cotton cord to provide a breakable loop from the gathering mouth of the bag. This method worked for several drops, although we had to tie the linen cord around the cotton cord each time. This forced us to recover the trip line from amongst the feet of the thundering herd of youngsters diving after the candy. Finally, for our last drop, we got it right. We attached the trip line to an o-ring at a spot two or three feet (more than the length of the bag) down the flying line from the drop bag. This way we could retrieve the trip line easily.



What we have is a drop method that may be crude compared to your more sophisticated rigs, but it has advantages. It's quick and easy to assemble and it's inexpensive to make from readily available materials (plastic trash bag, linen or Dacron flying line, cotton string and an o-ring). *Tip:* Save some candy to give to youngsters who might not be lucky in the scramble.



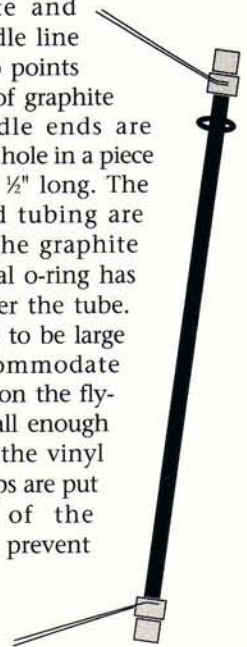
3 FLIP-FLOP CONNECTION

From Kevin Shannon, *Carlisle Kiteworks*, Carlisle, Pennsylvania:

This general technique appeared previously in an article on Takaji Kuroda's Convertible Box in *Kite Lines* (Fall 1980). In his book about his "Magic Kites," Kuroda also describes convertible sleds, rokkakus and rectangular kites. Kuroda used a similar technique with box kites, attaching a stiff wire directly to the frame.

But Kevin has devised his own technique for converting a four-foot rokkaku. He finds the correct bridle point for each

end of the kite and replaces the bridle line between the two points with a $\frac{3}{8}$ " piece of graphite tube. The bridle ends are passed through a hole in a piece of vinyl tubing, $\frac{1}{2}$ " long. The bridle loop and tubing are then glued to the graphite tube after a metal o-ring has been slipped over the tube. The o-ring needs to be large enough to accommodate the swivel hook on the flying line, but small enough not to slip past the vinyl tubing. Vinyl caps are put on the ends of the graphite tube to prevent line abrasion.



This technique lets a flier switch the kite to upside-down position in mid-air by sliding the bridle from fore to aft position. You let the flying line go slack and (except in very strong winds) the kite will tumble and turn a bit in the sky. If you pull in taut again at the right moment, the tow point ring will switch positions firmly.

The graphic possibilities of this technique are open to the imagination, starting with the face reversing from smile to frown.

No one has tried the system with a competition-sized rokkaku, but probably someday someone will.

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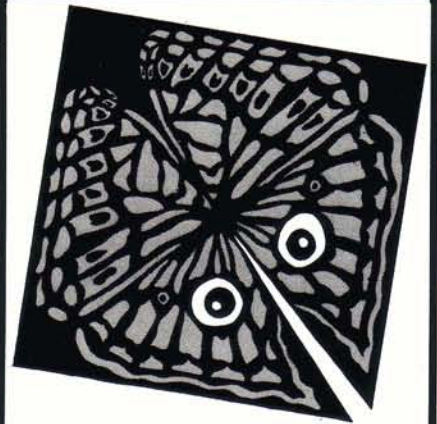
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News, Rumors & Miscellany

Conclusive proof that young and old can fly was shown at the Hawaii Sport Kite Challenge (March 6-8, 1992). The oldest competitor was Ken Linn of Hon-Honolulu, Hawaii, who won second place in novice ballet at the age of 71. The youngest was Luke Ozolins of Trinity Beach, Australia, who walked off with the gold in both novice precision and ballet and took fourth in quad-line ballet—all at only 8 years old!

Gauntlets are down for at least two serious kite traction races. Within a year, a cross-Channel race will match the Peel kite by Peter Lynn against the Flexifoil as made in Holland. The challenge was made by public declaration at the Cervoling kite festival in Le Touquet, France, on April 26, 1992. Rumor also has it that a speed race on the beach in England is planned for October this year. In this case the kites will pull carts rather than boats.



Justin Montgomery, age 7.

Pierce County Kitefliers Association members were drawn to the story in the Tacoma, Washington newspaper of a boy going through chemotherapy to fight cancer. A photo showed 7-year-old Justin Montgomery flying a kite. The club raised money for the boy and made him a member of the club. At a recent fly, Justin was given a Cheetah stunt kite (donated by Wind Toys), lines, handles, stakes, a club nametag, a t-shirt from Mainframe Kite Shop and some flying lessons. As Jessica Palmer wrote, "Justin was a little

overawed at first. But as soon as he got his kite in the air he forgot his shyness and concentrated on having fun. When the afternoon ended, he'd made some new friends and gotten some airtime with his new kite. I'm not sure who had more fun that day—Justin getting his new kite package or the club members giving it!"

News We Regret Department: From Frits Jansma of Alkmaar, The Netherlands: "A 22-year-old resident of Putten (a small town in Holland) was lifted 5m (16ft) high on a 10m (33ft) line from a Flexifoil on the beach at IJmuiden on January 1, 1992. He fell to the ground and was pulled in the air again while he was entangled in the flying lines. Then he fell to the ground again and suffered a spinal cord injury. He died in the hospital a few hours later."

From our Australian friends Simon Freidin (Melbourne, Victoria) and Neil Taylor (Wembley, Western Australia): On December 3, 1991, after the "Kites in the Tropics" event in Cairns, a six-year-old girl standing next to a rolled-up parafoil was caught on its lines when playful children combined with a sudden gust of wind to pull the kite aloft. Little Katy Johnson instinctively grabbed the line and before she knew it she was flying 300 yards in the sky. Attempts were made to get her down and the kite began to drop. When it was 20 feet from the ground, Katy lost her grip and fell to the grass, suffering only a broken thigh. "The accident got wide press coverage (unfortunately)," Simon said. So true! It made the *National Enquirer* in the U.S. in the April 21, 1992 edition with the screaming title "Kitemare! Life-and-death horror as kite lifts little girl 180 ft. into the air."

Speaking of major cross-water drags—how about an ocean? Dan Eisaman, known for his crossing of all the Great Lakes except Superior, is at this very moment (as we go to press!) attempting to cross the Atlantic from Spain in a boat powered by two Flow Form kites. "Nothing sophisticated," he said with pride in his hasty phone call just before leaving for Spain in late April.

Be careful where you leave your kite line! In a park in Waterloo, Ontario, Canada, a great horned owl was discovered dangling by a wing from a discarded kite line strung between two trees about 40 feet above ground. "It was a pretty sad sight," said naturalist Ted Cheskey, "this majestic bird caught up there, and it was going to die if we didn't do something." Fortunately, the bird was rescued with the help of the fire department and taken to the wild bird clinic at the University of Guelph where its condition stabilized prior to release.



Illustration: Lisa Craig

Desert: ideal place for kiting? Not quite, says Roger Hobson, who lives in Oman. Here he finds "a hard and hostile, rocky terrain with jagged peaks and ridges and very sharp, hard, flint-like stones on the ground" that easily cut kites and particularly kite lines. Then there are the "savage camel thorn bushes, which can shred ripstop nylon with ease."

"Summer is a real hell on earth, the temperature can reach 55°C (130°F)" but at least thermals are so good that "even when the sun goes down the residual heat keeps you soaring." Roger recommends a hat, sunblock, plenty of fluids, and sunglasses. He adds a

pair of overglasses for extra protection from the glare and dust.

Wind? Varies with the season. Sometimes there are "strong, gusty blasts," good for stunters, but launching plays havoc with lines laid over stony ground. Roger parks his four-wheel drive facing the wind and sets his kite across the windshield to launch it.

Local reaction to kites has been neutral except once an old Arab bedouin in a dish-dasha (traditional dress) came gesticulating and angry that his herd of goats would be scattered by Roger's neon kite. Roger said, "I gently landed and packed away, true to the kiteflying code of diplomacy."



From the Netherlands comes a picture of an unusual winged box kite, originally designed by Charles Lamson in 1898. Jan Fisher writes asking us if we have any more information on this kite, which he discovered as a picture on an old postcard. He built a scale model, then a full-sized kite, 2.7m x 2.5m (about 8x9 ft). He says "It flies good." The kite is also pictured in *Hart's Kites: An Historical Survey*, whose source was an 1898 magazine article by George Varney. Jan's workmanship in recreating the kite draws our admiration.

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THE BIENNIAL SUMMIT IN THAILAND



George Peeters

Above: friends in flight Michael
Alvares, Helen Bushell
and Tony Wolfenden.
Right: Ines Elvira Uribe with
Colombian kites in front of
hospitality shelter.
Opposite page from top: tulip with
inflatable tail designed by Hans
Wiebosch, Gil Marcus and Frits
Jansma, launched by Edith
Ockeloen; and Blowfish line toy
with spiny handles by Peter Lynn
bounces off the ground, in and
out of the arms of children.



Mel Govig



Mel Govig

BY MEL GOVIG

“Statements from the heart” said organizer Ron Spaulding to describe the kites at the Third Biennial Thai International Kite Festival.

Just as amazing as the quality was the quantity—hundreds of kites, flown by more than 80 fliers representing 18 countries. If you could not travel around the world to see outstanding kites, you could do just as well by

making this one trip to Thailand.

The event, February 7-10, 1992, was part of the Thai Arts and Crafts Fair in honor of Her Majesty Queen Sirikit's 60th birthday. The dates of the festival were changed to the holiday week after Chinese New Year, and the location was moved from Pattaya, in the south, to the town of Bang Sai, Ayutthaya, about an hour's drive north of Bangkok. Afterwards visitors could go south to an additional kite event, February 14-16, in Satun province, near the Thai border with Malaysia. There would be time, too, to get acquainted, tour Bangkok and frolic on a tropical island.

Only after I am home do I begin to appreciate the planning and energy, especially on the part of the indefatigable Ron Spaulding, that went into making our stay meaningful and enjoyable. Only now do I see how the budget, which included large subsidies for the kitefliers, could pay off for this country.

The Tourism Authority of Thailand (TAT) is making a renewed effort to attract family and recreational travelers. New parks and resorts are part of the message: Thailand is safe, beautiful and culturally rich

Hallmarks of the Festival

A notable feature of this event was that about half the fliers were artists/designers by profession. This is a trend we noticed as early as 1978, but only now has it become so strong and obvious. As long as it isn't perceived as elitism, this is a shift I like in kiting because I like surprises, and artists are usually surprising. Our group certainly was. Their talents made a beautiful splash in the sky and also filled the evenings with gentle good humor and stimulating conversation, exhibitions



Mel Govig

1992 Thailand International Kite Festival Attendees

ANNOUNCER Shakib Gunn	Malcolm & Jeanette Goodman Martin Lester Natalie Woodward	INDONESIA Rai Andayama Adnyana Nyoman Nyoman Rawat Wisnu Bawa Temaja Ketut Widana	MALAYSIA† Mr. Ibrahim Mr. Jamaludin Mr. Kadir Lee Poi Long	Tan Soo Liang Low Chinn Nghee	Clare Forster* Jon Reinschreiber* & Jill Duncan* Betty Street Leland Toy* Joe Vaughan* Dave Wallace
AUSTRALIA Michael Alvares Helen Bushell* David Chandler* Neil Taylor Tony Wolfenden*	FRANCE Pierre Fabre* Max Gaillard Michel Gressier* & Régine Chourane*	ITALY Francesco Innisi* Silvio Maccherozzi* Francesco Milioni* Giuseppe Valzania*	NETHERLANDS Frits Jansma* & Edith Ockeloen* Gil Marcus* & Bianca Severijns* Hans Wiebosch	TAIWAN Kin Kan Hsieh* Chiu Mei Hsieh Tai*	THAILAND Thai Kite Heritage Group Satun Kite Club* Kitefliers of Buriram* and others*
COLOMBIA Ines Elvira Uribe* and Jairo Montoya Ramirez* Juan Manuel Aristizabal Agudelo* Luis Javier Velez Londono*	GERMANY Jürgen Ebbinghaus Bernd Knüpfer* Peter Malinski Wolfgang Schimmelpfennig Rolf Sturm	JAPAN Masaaki Modegi Teruaki Tsutsumi Haruhisa Saito Seiko & Akiko Nakamura Tadakazu Funasaki Nobukuni Sato Morihiro Takeda Eiichi Memezawa	NEW ZEALAND Clyde Cook* Kirrille Lynn* Peter Lynn Peter Whitehead*	THAILAND Thai Kite Heritage Group Satun Kite Club* Kitefliers of Buriram* and others*	"THE PRESS" André & Lisa Baget Simon Freidin* Mel Govig* Hans de Roos
DENMARK Jørgen Møller-Hansen*	GHANA James Sampson*			UNITED STATES Jim & Kay Buesing* Tom Casselman David & Susan Gomberg George Heen Bill Lockhart Robert Loera Louise Pearson* George Peters* &	*Asterisk indicates attendance at the Satun Kite Festival. †Dagger indicates competing in Satun.
ENGLAND Steve Brockett*	HUNGARY István Bodóczy		SINGAPORE Ng Thang Eng Robert Foong		

and music. Smiles spread over our faces each night as we listened to the downbeat jazz on flute, guitar and penny whistle by James Sampson and Louise Pearson.

Another hallmark of this event—and another trend in kiting—was the number and diversity of soft kites. Great for travel, little danger in a crash, they go far beyond parafoils and Flow Forms. Our sky was full of cuddly monsters: a huge dragon and cobra by Wolfgang Schimmelpfennig; a fantasy dragon and swimming dual-line frog by Jürgen Ebbinghaus; Peter Lynn's octopus and manta ray; Legs and more Legs by Martin Lester; Rolf Sturm's airplanes; and a puffy rendition of a Japanese cicada by Simon Freidin.

Line attachments included soft forms as well. Bernd Knüpfer had a whole collection of remarkable spinners. Peter Lynn had his centipedes, a new kite-powered boat, and a delightful new involvement toy for children of all ages, his Blowfish.

Some Highlights

- Leland Toy engineered an event-within-the-event using his "Shadowlines" kite, a large Tyvek rectangle with many bridle lines and a minimal floppy fiberglass frame. The only way to fly the kite was with complete cooperation, each person holding his or her line to maintain the shape of the kite in the wind. It worked, for a moment or two.

- Frits Jansma and his wife Edith Ockeloen brought paper tulips from Holland and "planted" them in front of their tent. Later Frits put tulip kites in the hands of fliers from each country and everyone "represented" Holland during one of its presentations.

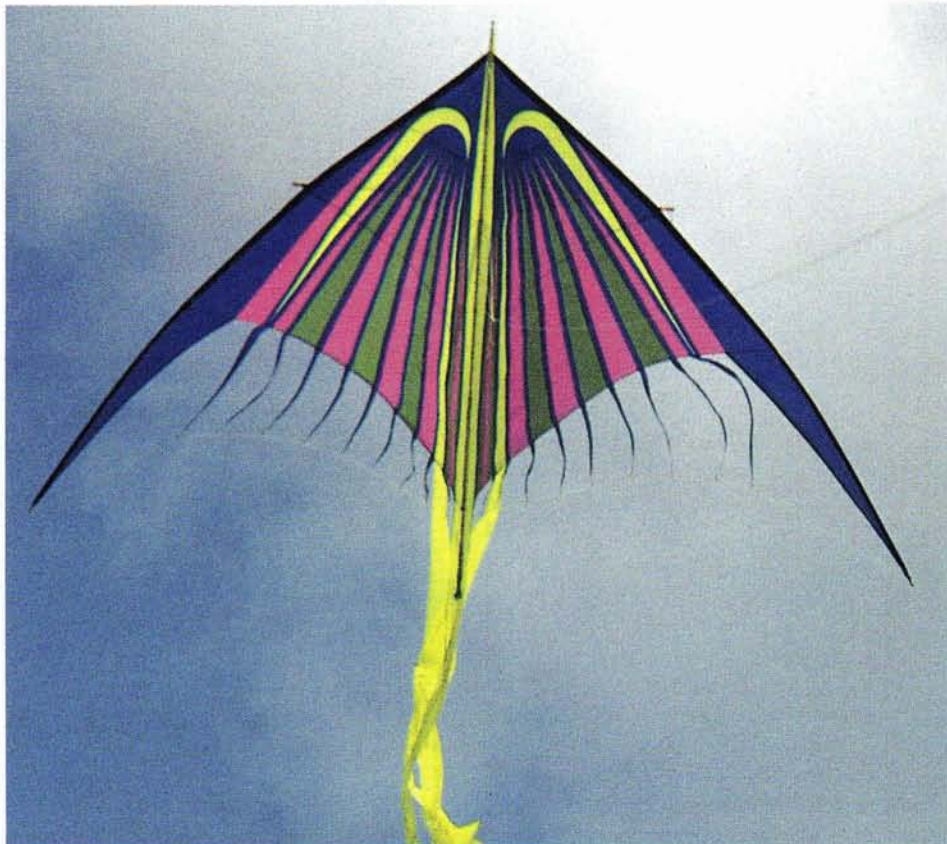
- George Peters and his wife Clare Forster sent kites into the air and parked kites and banners on the ground, turning a thousand square feet of field and the air above it into a brilliant display of strong, integrated graphics every day. (See *Sky Gallery*, pages 62-63, for pictures of George's kites.)

- Deltas were the forte of Italy, including a trio of earth-tone deltas that complemented the African shirts of James Sampson (a resident of Italy but an official delegate of Ghana), and carried appliqués of past greats of jazz. Francesco Milioni flew a truly new delta. Though its wingspan was about 20 feet, the design was delicate, with a curvilinear shape, feathered trailing edge, taut sail, no rattle—poetry in the air.

- Box kites were well represented. Peter Malinski's incredible field of kites included a compound giant box he hauled into the air

Right, a big yakko-style wing by Claudio Capelli is brought and flown by Silvio Maccherozzi.

Center, Francesco Milioni's delta with feathered trailing-edge points held in place by line. Bottom left: Edo-kaku-based art by Michel Gressier and Régine Chourane ; right: István Bodóczy flies an asymmetric example of his daily-made paper kites.



Mel Govig

Mel Govig

Simon Freidin

Simon Freidin



Mel Govig

every time the winds and the 90-degree temperatures allowed. Michael Alvares flew a similarly large compound kite that contrasted with Peter's in its use of cotton sails and standard connections rather than ripstop sails and custom fittings. Simon

Freidin flew his faultless Hargrave on winds and at angles that would embarrass a delta flier. Cody lovers had their champion too, in the person of Francesco Innisi.

- Yari-pa is the name of a reed, a kite club and a point of view. The Colombian team, headed by Ines Elvira Uribe, advocates renewable materials for kites. Their six- and seven-sided kites are made with cotton sails, yari-pa spars and heart-of-palm center connectors. Even the tails are in the yari-pa spirit, 4-inch wide double thicknesses of crepe-paper sewn together into 50-foot lengths. These "simple" four-foot kites, with three or four 50-foot two-color tails, made an impressive display very high in the sky.

- István Bodóczy of Hungary traveled light. Each night in his hotel room he made the paper kite that he would fly the next day. Each of the three was an original work of art, including one that was pronouncedly asymmetrical—but flew well. When he wasn't flying, István helped whoever needed help.

- Two of everyone's favorite kitefliers were Seiko and Akiko Nakamura. Like István, they made no large display, but when they were on the field with their bees and their Nagasaki hats, their natural good humor attracted other kitefliers like bears to honey.

- Helen Bushell is comfortable, down-to-earth and informed. I enjoyed noticing that each time she takes out her Hewitt bird, she rearranges it to her taste, adding or subtracting spars or tails, sometimes right on the field.

- The rokkaku challenge was a massive ensemble of kites, 39 of them! And of course each and every one was a beautiful example of rokkaku kitemaking.

- And then there was Shakib Gunn, pre-eminent master of ceremonies from Singapore. He speaks enough languages to find one in common with almost everyone. He is already familiar with fliers and kites from every country, but if he doesn't know you at 8:00 a.m., he's an old friend by noon. And if he hasn't seen you for three years, the next time he sees you it's as if you were picking up a conversation from yesterday without interruption. He's a one-man band leading the parade when a parade is called for. He's a good-humored critic when you transgress. He feels the pulse points on the funny bones of every culture on earth. He's Shakib!

Some Lowlights

- Recent drainage and burnoff of the rice paddies that became our field left some fliers looking like chimney sweeps. At first, the New Zealand crew was flying in a real soot



Simon Freidin



Mel Govig



Mel Govig



Simon Freidin

Top and down left, great inflatables: a stunting frog by Jürgen Ebbinghaus captures the form of the frog accurately, particularly its legs; two fully dimensioned creatures by Wolfgang Schimmelpfenning—a writhing cobra and a winged dragon. Center right, the Santa Maria ship kite by Hans de Roos replicates every detail of the galleon under full sail and commemorates the voyage of Columbus 500 years ago. Bottom, Pierre Fabre shows his boldly designed double Eddy to Shakib Gunn, left, and Lee Toy, right.

The Great International

marooned on a prisoner-of-war island with nothing much to do



The Group: (back row) Régine Chourane, James Sampson (pretending to fly his kite), Francesco Innisi, Clyde Cook, Steve Brockett, Michel Gressier, Mel Govig, Tony Wolfenden, Joe Vaughan, Frits Jansma, Ines Elvira Uribe, Kay Buesing, Guiseppe Valzania and Paul Juillerat; (front row) Pierre Fabre, Silvio Maccherozzi, Gil Marcus, Bianca Severynse, Edith Ockeloen, Helen Bushell, Jairo Montoya Ramirez and George Peters.

Take 30 world-class kitemakers and fliers from 10 countries, put them on an 18-hour trip from Bangkok to the southern tip of Thailand, ferry them out to a tropical island with white sand beaches and swaying palm trees, and leave them there for a couple days.

It was a recipe for relaxation and an ideal stop between the festivals in Bangkok and Satun.

Reading over the information sheet given to us by our host, Ron Spaulding of the Thai Kite Heritage Group, a picture of paradise began to form. "The island's coast is decorated with many small bays with white sand beaches formed by small perennial streams flowing from the inland mountainous areas. Coral reefs, turtles, dolphins, whales, tropical reefs, pirate coves and interesting caves." It sounded like we should stay longer. "Tarutao Island was once used as a Japanese prisoner-of-war camp." Well, maybe two days is enough.

We loaded all the gear off the ferry and with a quickening step everyone made a beeline to the beach. I swear I saw puffs of steam coming off our bodies as we all hit the water. A little later the kites went up with

sunny-faced fliers bobbing in the blue-green waters. We were told just to bring "a couple of kites" to the island, but these were world-class kite fanatics, judging from the pile of kite bags left off at the island's dock. New Zealanders Kirrilee Lynn and Clyde Cook even brought Peter Lynn's one-man kite trimaran and plied the waters back and forth with a big soft Peel kite as a sail.

Kites bloomed over the white sands all afternoon. The sun set and the long line of castaways meandered up to the beachside dining veranda for an evening of Thai food, beer, relaxed conversation and songs. This sort of life can get infectious.

It was late night under tropical stars when we all drifted to our quarters in the bamboo longhouses and fell into dreams.

A rooster reveille broke the dawn as he strode beneath the floorboards of our rooms. I heard a few groans and curses through the woven bamboo slat walls as he made his way down the line of the longhouse. "Crock-cock-doodle-do-do!"

The effect of the tropics started to set in on us the second day. It took on a look of relaxed indifference or even quiet abandon. At lunch I noticed it at our long table

scattered with beer bottles and emptied plates of Thai delicacies. The lapping of the cool beach waves seemed to pull us like a magnet.

"WAIT!...I'd like to make an announcement," I said. "There will be a Natural Fibers Kite Fly and Contest on the beach today at five o'clock. The rules are natural fibers only: leaves, sticks, whatever." A spark of mental movement fluttered around the table. "Oh, and only natural fibers. That means no plastic, no fiberglass. Use what you can find. You can use your own string. See you on the beach at five o'clock. That gives you," a glance at my sandy watch, "about two and a half hours." A single rustle of chairs. "Oh, and there will be a natural award given to the best flier." Chairs shoved back and the crowd scattered in all directions. A few stood their ground, clutching their half-finished Singha beers and staring blankly at the horizon.

Soon the grounds of the camp yielded palm fronds, large leaves and stick collections that piled onto the shaded picnic tables by the longhouses and near the beach. The small groups of kite designers huddled

Natural Fibers Kite Festival

'cept think up new kinds of kites



Story & Photographs by George Peters

The creators with their creations, left column from top: Helen Bushell and Tony Wolfenden from Australia and Pierre Fabre from France. Bottom right: George Peters and his seed pod kite train.



over their materials as hands and Swiss Army knives cut and shaped the floating ideas. Wandering around the workshop grounds, I found the competitors in deep concentration over the shaded tables. Australian Tony Wolfenden was piecing together an elaborate, thin-leaved miniature rokkaku and Helen Bushell added some crab-leg palm fronds to her leaf kite. English kitemaker Steve Brockett clipped a swallow-tail leaf on the tail spinner to his leaf kite. Mel Govig, our *Kite Lines* representative, stood ruminating over the proper bridle position for his woven palm fronds. "Think it will fly? Only one way to find out!"

I went off to the high wall of cliffs behind the camp scouting for materials. I remembered seeing some bamboo in the pile of camp debris there. As I broke through the bushes, a chorus of wild screams startled me. A tribe of about 50 large monkeys scrambled up the wall of the cliff and cursed at me from above for disturbing their grounds.

A short distance away, a tall, leafless tree dangled one giant canoe-shaped seed pod from its very top branch. My "Curious George" syndrome kicked in. I just had to have that pod! I shook the tree's base a couple of times. I shook it harder. Suddenly the pod let out a loud pop and split open. The sky filled with flying, gliding and fluttering white seed airplanes—round, the size of your palm. Their glide ratio kept them above the grass so I could rush to gather about a hun-

dred into my pockets. "A kite train!" I ran to my work area to thread the fragile seeds in a long line. There was barely a half hour left until the beach fly.

On the beach at five, the naturalists gathered to test the winds. Several creations took to the air like they were made to, hovering and darting in the warm on-shore breeze. Others took a little more bridle adjustment or maybe a little more running. I ended up running into the water with my seed train kite never rising above a long horizontal line of spinning and fluttering seeds. It came out of the waves a tangled, dripping mess.

Others were doing fine. "Hey! Look at mine! It's flying." The leaves danced overhead to our smiles.

"O.K.! Group photo, everyone!" Cameras clicked at the group of proud and happy kitemakers. We posed with the warm fading light on our faces and our kites in our hands.

"Did someone say there would be an award ceremony?" "Your natural awards are in your hands," I answered.

The sun set to another round of Singha beers, deliciously hot Thai food and home-spun music. One last midnight dip into phosphorescent, moonlit waters and the next thing I remember was the rooster call and the shouts that the ferry was at the dock ready to take us to the Satun International Kite Festival.

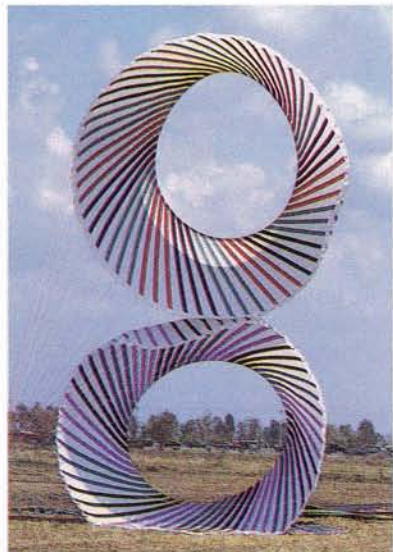




Mei Govig



Simon Freldin



Simon Freldin



Mei Govig

Top, Bill Lockhart launches his latest patchwork design. Center row from left: Silvio Maccherozzi holds aloft his latest multicell box, thin as a waffle. Moving art on a kite line by Bernd Knüpfner: two *bols* (crafted after models by Michel Gressier) can reverse their spin simply by being turned inside-out and can roll over and under each other in the air or on the ground; snake spinners are light and ethereal as they rapidly coil and revolve on sophisticated bridles and instantly create a crowd. Bottom, the *wau kwai*, or buffalo kite, incorporating the head and horns of the water buffalo (a symbol of the Satun region) is seen in a shelter where lunch and social life goes on.



Mei Govig

bin, and Kirilee Lynn and Clyde Cook looked a sight after the first day.

- Another hazard was the three-inch cracks in the earth from too-rapid drying of the paddies. The cracks were not improved by being covered over with straw. It became known that I carried a supply of industrial-

strength Tylenol to remedy the resulting sore ankles and legs. Despite the heat and rough field, injuries were few and minor. The site was otherwise outstanding: huge and open, with shade awnings, tie-off posts and a lockable room for kite storage.

- The Thai fliers competing with their *chula*

and *pakpao* kites* performed on a separate field, away from the international guests.

Continued on page 46...

*A definitive description by Ron Spaulding of the history and traditions of kiteflying in Thailand appeared in *Kite Lines*, Winter-Spring 1987. The issue following it featured the First Thailand International Kite Festival.

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André Cassagnes is a world renowned character of the kite community and the most famous kitemaker in France.

But you might never have met him, unless you have visited some of the great European kite festivals in Dieppe, Scheveningen, Oostduinkerke, Berck-Plage or Castiglione del Lago, where he regularly goes. André has never actually traveled across an ocean to show his kites in a distant country, although invited many times. He doesn't feel any necessity to travel across the world in order to enjoy kiteflying.

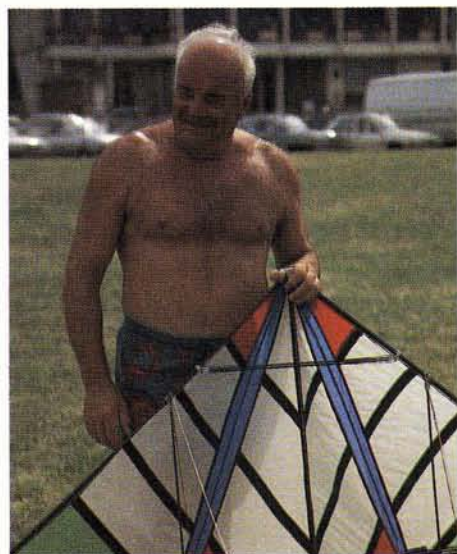
I met André from my first days of flying my kites in Paris. Every day of the week, he spends his entire afternoons test-flying his most recent designs and communicating his enthusiasm for kites to everyone passing by. Rarely have I met a kitemaker as welcoming and generous with technical tips as he is. Whenever someone is inspired by his design, it is one of his best rewards. "If people copy your own ideas, it shows that at least they are good ideas," he said to me.

André is a reference for many professional and novice kitemakers, both in France and abroad.

A Visit with André

To learn about the origin of his kitemaking beginning 15 years ago, I visited André several times in his basement workroom.

Born near Paris in 1926, he has lived since childhood in Vitry-sur-Seine, in the southern suburbs of the capital. As a child he never succeeded in constructing any kites which could get aloft. During World War II, following plans for a French pear



The Ingenious Kitemaker ANDRÉ CASSAGNES

ARTICLE & PHOTOGRAPHS BY PIERRE FABRE



Above, three ring kites called Couronnes (Crown) André Cassagnes (CAC) fly with a large spinning wheel hanging from the line. Below, André poses at Dieppe in 1988 with one of his earlier stunt kites.

kite published in *Le Journal de Mickey*, he could never find good enough materials, so the kite was either not strong enough or too heavy in order to fly properly.

At the age of 18, after obtaining his *certificat d'études*, he immediately began working with his parents who owned a bakery. Because he was allergic to flour, he soon had to look for another job and was employed by a company as an assistant to their electrical technician. It was only through experience that André progressively developed his amazing sense for practical things and mechanical designs. Later, the small factory was bought by Rhône Poulenc, a major French chemical group and until retirement in 1987, André worked there as an electrical technician in the maintenance department.

Yet, as this occupation never fulfilled his creative mind, during his spare time he created and built himself many functional prototypes of mechanical games which appealed to a player's dexterity. Most of these toys were devices for drawing geometrical patterns and used either very sim-

ple or rather complex systems.

This hobby led him to invent what was to become one of the most popular toys ever. About 30 years ago, André Cassagnes created the *télécran*, known as Etch-a-Sketch in the USA, which has since been a bestseller in over 50 countries. Dozens of millions of units have been sold.

The success of his invention allowed André to help his children, to buy a new house and later to finance his kitemaking passion without having to care about bills. After kites became his main concern, he still continued to design other drawing prototypes and even though four of them found their way into mass production, he still considers this activity more like a hobby than a business. This fascination André has for geometry and his flair for inventing mechanical and construction systems are the basis of all his kite works.

Kites Begin at 50

At the age of 50, inspired by the sight of a kite flying at the Normandy seaside, he bought his first kite, a long Mylar serpent. Very soon, to explore what could be done with different shapes and after having read a few books showing the basic designs, he decided to build kites which almost never followed any existing plans. Meeting

other kitemakers on the flying fields of Paris, he was particularly impressed by the technical perfection of the kites by his friend Guy Gérard. These showed him the level to which he had to set his standards.

One of the first remarkable kites André created was a large three-dimensional star which showed that these rigid structures were to be his main research direction. He then decided to develop a modular construction system which would allow one to build many different kites using the same basic elements: aluminum arrow shaft tubes; plastic joints with various angles; and relatively small triangular, square or hexagonal ripstop nylon sails which can easily be attached to the frame structure.

The major difficulty was to produce the plastic joints in large quantities, because so many could not be handmade, and plastic injection molds are usually so expensive that no individual can afford such an investment. But among old friends and neighbors of André was Mr. Minot, the owner of a plastic injection factory! Thanks to his help, André had his polyethylene joints

THE CVCF AND DIEPPE

Between 1900 and 1910, about two dozen kite associations were founded in France. One was "L'Union des Cerfs-Volantistes de France" and the other, a more select club, was "La Ligue Française du Cerf-Volant." Shortly, the First World War caused the end of both associations, and later airplanes and gliders attracted many previous kitefliers. So kites mainly went back to being simple toys for children.

In 1977 emerged a new kite association, Le Cerf-Volant Club de France, initiated by Jean-Louis Bouisset and a dozen friends, including André Cassagnes, who used to meet at least every weekend on the flying field of Vincennes, near Paris. The club now has over 700 members and although several local and national associations have appeared during the past 10 years, it remains by far the largest group.

The CVCF was associated with the Dieppe Festival since its beginning in 1980. It was only by chance that Max Gaillard, who was in charge of Dieppe's cultural center, saw in Paris an exhibit of kites by members of the club. André Cassagnes's creations particularly struck him and he contacted the group to organize what was to become one of the major international kite festivals. This September 12-20, the Seventh Festival Internationales du Cerf-Volant de Dieppe promises to be an even greater event than before. —P.F.

Below top, André launches one of his many beautifully made line climbers. Middle, a reel made by André and marked with line length and strength. Bottom, André keeps his workshop in perfect order, fully equipped. Inset, André's hands hold some of his specially cast plastic connectors.



made from his precise plans. He began his series of modular kites, dozens of different ones, each being extremely lightweight and efficient in flight. These kites reached dimensions up to 23 x 23 feet with 170 cells. Yet each could fit, once dismantled, in a plastic storage box no longer than 20 inches.

At one time a major American toy maker, Hasbro, showed some interest in putting André's kite system into production. But they finally dropped the idea because they couldn't find a way to make it profitable. André himself has never considered kitemaking as a business. For him, it must remain a field in which he can let his imagination go free, without the constraints imposed by mass production and marketing. Most of his kites feature several unique and sometimes complex details, such as carved and articulated handmade plastic joints or multiple tensioning lines which are seldom found on commercial kites.

BAC, CAC, DAC, DACRO...

Using his modular system, André successfully found a way to build a much lighter version of Bell's tetrahedral kite, with far fewer spars than in the original design (four struts for each cell instead of six). This kite was called "Bell André Cassagnes" (BAC). Then getting away from Bell's influence, he designed many other combinations of various cell shapes fitted with multicolored sails, which made totally original kites. →



The most beautiful and technically remarkable series he has made is the Couronne (Crown) André Cassagnes (CAC) which took him several years to develop. CAC series are large three-dimensional ring kites, up to a diameter of 13 feet, some flying facing the wind, others flying flat. André even made a dual-line stunt version, with a pair of steerable rudders. Another ring design is a large spinning wheel hung from a line. Although it is not a kite, when fitted with many tiny bulbs at night it produces a most beautiful effect.

Once he starts with a basic concept, André tries all possible improvements, variations and combinations until there is nothing left to imagine you could do with it!

The stunt kite craze began in France only about three years ago. It brought a lot of newcomers into the kite field, including a few "mad dogs" who didn't have much consideration for André Cassagnes's kites. Since then, most of them have learned to appreciate and respect the work he does, for he has actually been making stunt kites since the late 70s and they have now become his main "research program" under the name Dirigible André Cassagnes (DAC).

At the beginning, his kites were inspired by Skynasaurs, but he added his own innovations. The sails were so evenly tensioned that these kites were faster than any other delta stunter—and totally silent. To produce a gentle and modulated sound, André had the idea to use "humming bridles," some of the bridle lines being replaced by a flat ribbon. A ventral fin, or sometimes even two of them, rapidly became a regular feature on all DAC kites. These provide additional stability when flying straight, and better control in curves.

Yet André has never been attracted by competition, so most of his kites are designed for fun rather than for tracing the most precise figures in the sky.

One of his most recent stunts, called DACRO, is a real plaything and it is probably the most innovative design for a dual-line kite that I have seen over the past few years. As you might have guessed, DACRO stands for Dirigible André Cassagnes ROKKaku, but apart from their hexagonal shape, these kites have nothing in common with the original Japanese rokkaku. The first prototype in this series is the most amazing: it is a biplane kite with two superimposed flat hexagonal sails and a triangular rudder in between. Both sails are tensioned like drum heads by a radial ultralight tubing structure.

"It is real fun to fly," said André, "so gentle and easy to control that even young children could play with it! If you fly several such kites together and try to collide

them, they will just bump, bounce aside and keep on flying."

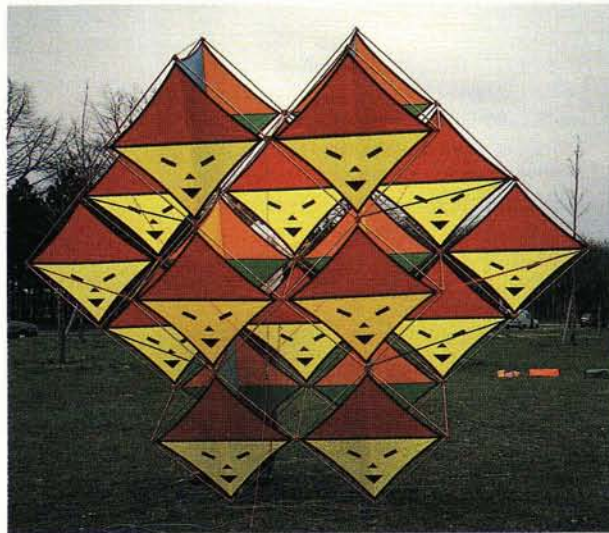
Kite Genetics and Evolution

Three weeks later, I visited André again. The biplane DACRO kite had already disappeared. He showed me instead three new prototypes, still using hexagonal sails but much better performing according to him.

Two were simple hexagons fitted with fins, the third was the juxtaposition of two hexagons, secured only by two attachment points and a single additional spar in the back to prevent folding. As he often does, André had cut without hesitation into the sails of his previous proto-

his specimens to create new hybrids. Constructing kites with his modular system looks so much like building up new molecules, mixing chromosomes or assembling the cells of a flying entity!

According to André, we are still at the very beginning of the stunt kite era and hundreds of innovative designs are still to be discovered.



Right, a multilayer kite with faces that look back at the flier. Below, André holds up a biplane kite, two connected dirigible rokkakus.



types to make this one, combining old and new pieces of cloth. You will not notice it unless you are told, but a piece of ripstop decorated with appliqué, might be reshaped several times and go through many different kites or line climber sails before André decides its final use. Permanent evolution and rebirth...

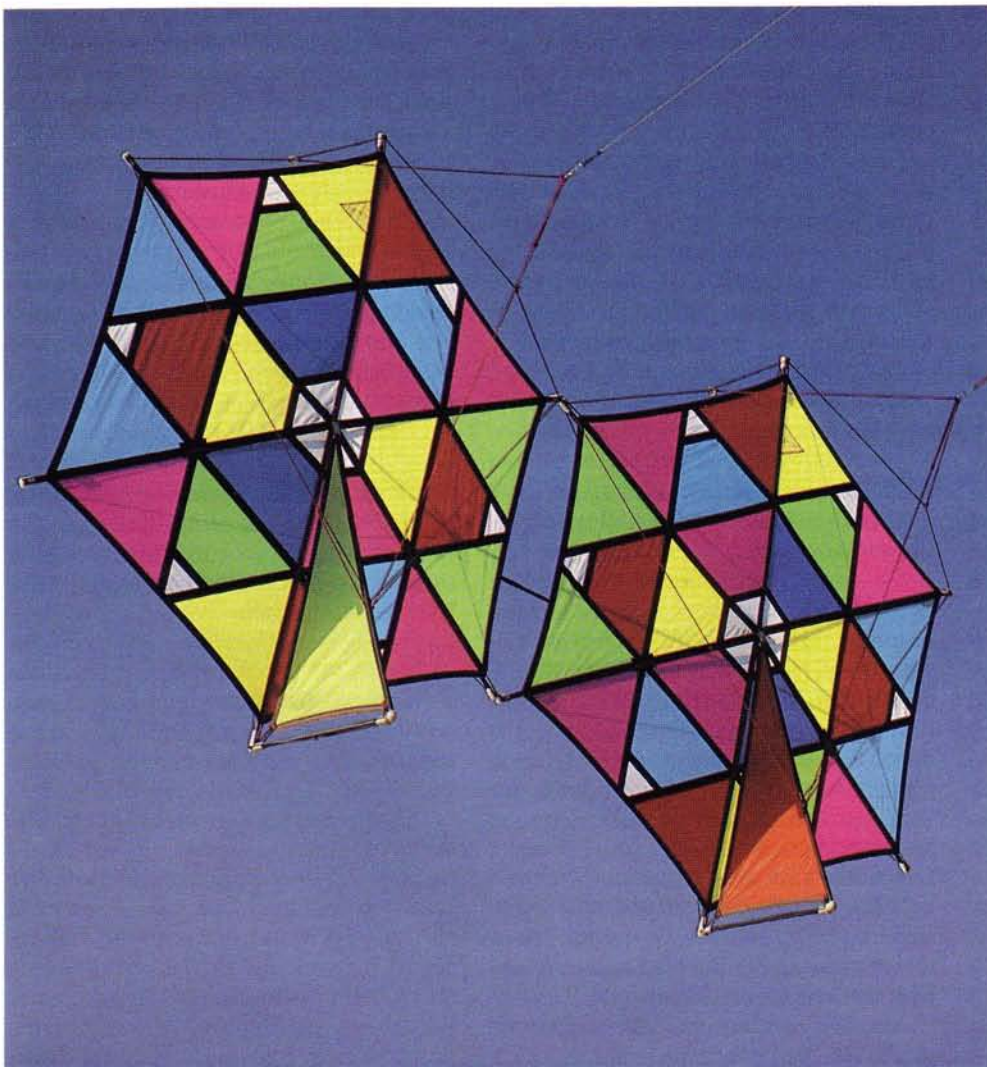
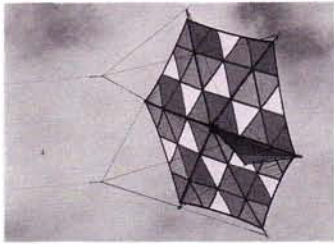
André describes his kitemaking as getting a basic design progressively rid of all the mistakes accumulated in it. He will keep working on it until it is perfected and only then will he skip to another one.

Like a genetics genius, André selects and combines only the best characteristics of

Kites as Art?

On his geometrical kite structures, André uses colors and sometimes simple symbolical designs, as his intuition tells him to do. Often his color combinations are quite "flashy" and might not fit the conventional principles of harmony set up by graphic designers! Yet, they are part of his originality and they reflect his enthusiastic and daring personality. I'd be delighted if someday the kite works of André Cassagnes were to be classified by art critics as "French Pop Art."

André likes to say, "I am not an artist, but I love symmetry and geometry. I am not an engineer, but I might well be ingenious."◇



DIFFICULTY OF KITEFLYING IN PARIS

Actually, kiteflying is prohibited within the French capital, even inside the few parks and gardens which would be large enough to launch a giant kite. Yet, because most police officers don't know the details of the regulations concerning kites, they might hesitate before considering your favorite kite a threatening weapon, and might leave you just enough time to take a picture of it flying under the Eiffel Tower.

If you don't want the risks, you'll have to go to one of the few places just outside the city limits where kites are tolerated, provided they adopt a low profile and don't endanger the helicopters and airplanes flying overhead. Knowing about the historical flying events which took place in these locations might compensate for the inconvenience of having to drive at least half an hour to go there from the center of Paris.

André Cassagne's usual flying field is located in the Bois de Vincennes. Here was held a great competition, organized during the 1900 Universal Exhibition in Paris. The winner was Lecornu with his multicellular oblique kite. Also, the first imported Conyne kites from the USA attracted the attention of French kitefliers.

Another kiteflying field is the Bois de Boulogne, facing the gardens of Bagatelle. The first sustained European airplane flight took place here in 1906 when Santos-Dumont flew over 220 meters in his *14-bis* cellular plane.

Stunt kitefliers will prefer a third place, in the northern suburbs, very close to Le Bourget airport, which in 1919 was built as the first international airport in Paris. Now located here is the Air Museum, where on display are several splendid replicas of famous kites, such as a Hargrave box kite made by Thierry Nenot, an expert in historical kites. —P.F.

Top right: one of Cassagne's earlier stunt kites. Views of the DACRO (Dirigible André Cassagnes ROKkaku), one the most innovative sport kites of recent years, from top left: a single taut rokkaku with rudder; close-up of junction at center, featuring a patch from the Junction Kite Club; André tensioning the back of a DACRO; and a pair of DACROS in dual-line flight.

Our kites are two miles up over Christmas Island, my friends are trolling for sharks and there's a dead cat on the runway...

TWO MILES ABOVE CHRISTMAS ISLAND



Spectacular sunsets like this are on display for the crew on Christmas Island every evening of their stay.

It started in the spring of 1989 when Dr. Ben Balsley of the University of Colorado's Cooperative Institute of Research in Environmental Science (CIRES) telephoned me. He wanted to study atmospheric electric fields by lifting ten 1.5-pound packages of telemetry electronics to various altitudes up to two miles.

Could I build high-lift kites to fly the sensors for as long as a month at 10,000 feet, in winds as low as 11 mph? Could a prototype kite system be built on a tight budget to prove it could be done? Ultimately, could we fly up to 50,000 feet? And most importantly, could we do it soon? Wow! Tough questions all.

My background in large (and unusual) kite projects told me this wasn't a job for one person. I needed a support team and I especially needed a specialist to handle computer analysis of kite designs and flying line properties. I was lucky to come in touch with Joseph Williams, an aerodynamicist and computer programmer who specializes in low-speed airfoil design.

Joe and I held many teleconferences with Ben to define the project objectives. Then Joe and I initiated a technical conference of top kitemakers to identify all the problem areas and to consider the most suitable kite for the job. We discussed project goals, payload, site data, stabilizers, cable catenary, drag, winches, cable attachments, air density, temperature—it was a heady evening. We had some of the best minds in kite science to pick.

Our primary goal was to build high-lift lightweight kites that would fly at a high angle. A kite at a high angle would have a shorter flying line for a given altitude than one flying at a lower angle. With less flying line to raise, the kite system would handle a higher potential payload and altitude. Not all kites having a high flight angle would continue to fly high when a payload was applied. We simply had to design the right kite for the job. This was the starting point for our experiments.

Fresh from the conference, Joe and I test-flew some popular kites. Early on we tried box kites, but they wouldn't fly at a high angle, with enough lift, to stay at 10,000 feet in an 11 mph wind.

Our flight tests with small soft kites showed more promising results.

We started measuring the actual pull of kites with a scale and encountered a major surprise. Kites that "experience" had shown had lots of pull . . . didn't! My 15' by 18' Flow Form kite dragged me all over the field in 15 mph winds, yet showed only 50 pounds of direct pull. We found that our sense of pull was faulty due to the concentrated tension of small-diameter lines acting on our hands.

Another surprise—we found that a long-line launch on a parafoil gave up to eight times more pull on launch than when cruising. This became significant with the kites we eventually built.

Joe then developed a software program to predict the performance and specifica-

tions of a total flying/lifting system. The program integrated kite(s), flight angles, windspeed, payload potential, cable strength, diameter, drag and catenary. Joe's computer analysis of the various kites showed that only a parafoil had the potential to meet the specifications.

The computer program predicted that we needed about 500 square feet of sail area. The problem was that windspeed couldn't be predicted. If we were to build one 500-square-foot kite, and if the wind were 20 mph or higher, the pull would exceed the strength of the line. However, if we were to build a train of 130-square-foot kites, then one or two could be removed to compensate for higher windspeeds. We decided that a train of four kites was the best solution. We also relied on computer modeling to decide the best locations for the kites on the cable.

Although we were able to design airfoils from scratch, we had only four weeks' time after approval in July, 1990 to build and test the kites, so we decided to go with a proven parafoil chord design by Adrian Conn of Canada.

Another factor in our success was Bobby Stanfield, a kitemaker noted for his detailed and accurate construction. We used double-sided Mylar tape to assemble the ripstop nylon fabric parts, and we sewed through the seams with a zigzag stitch. This technique is fast, accurate, pucker-free and improves the stress relief of seams. Best of all, the kite doesn't shrink

in the sewing process, a common problem with parafoils. Bobby ended up constructing three kites on his own.

In order to make our parafoils fly in train, we made the three lower ones in right and left sections. This allowed the flying line to pass between the kite halves. To simulate the load that the kites would lift, we borrowed a two-pound bag of sugar from Joe's wife Dixie and hung it from the line. It worked perfectly. The sugar bag got banged around a bit when the winds died but we returned it to Dixie's kitchen intact. We named the kite train "Dixie's Sugar"!

Bridle adjustments proved very touchy. As little as 1/8-inch has a great effect on lift and altitude. Because of gusty ground winds in our Pennsylvania tests, every flight was a difficult experience, but we finally got the bridles right. Final adjustments could be done on location.

We chose Kevlar as the flying line because of its high strength and low weight. We anticipated forces as high as 500 pounds on the cable. This magnitude of force requires mechanical advantage simply to hold it, let alone control at altitude. Somehow we would have to winch these beasts in and out. Remembering that yachts use serious winches to haul sails, we went to our local marine yard. Their specialist showed us an Australian winch with the right capacity. We took the winch head to a machine shop to smooth its rough surface. It needed a satin finish so the Kevlar cable wouldn't be damaged under tension.

The location chosen for the kite flights was Christmas Island (Kiritimati, Republic of Kiribati) in the central Equatorial Pacific Ocean. It is 1,320 miles south of Honolulu, Hawaii and 110 miles north of the equator. The island's advantages are a two-mile-long deserted military runway (Aeon Field) to fly the kites from, continuous wind,



Ben Balsley and Joe Williams test-launch a parafoil from Aeon Field on tiny Christmas Island.

and—best of all—a wind profiler radar and weather station. Wind profiler radar measures windspeed continuously between the ground and 13(!) miles high. There was another runway on the north end of the island for the once-a-week commercial air flight. Between flights, there would be no air traffic to interfere with our kites. Also ideally, the deserted military runway ran mostly parallel to the prevailing winds.

All our last work occurred in the face of a physical deadline, since the island wind data showed that the ideal winds for our kites would occur in August and drop off rapidly in September. So, in August, 1990 we packed everything and headed for Honolulu, but our kites were misrouted, and we missed the weekly flight from Hawaii to Christmas Island.

We made use of our days in Hawaii. Ben Balsley and his technician/photographer Chris Balsley spent their hotel time adjusting the 10 telemetry units to the same base specifications, checking connections, setting receivers, and fine-tuning the computer programs which were to record the data. Each of the telemetry sensors measured magnitude of electrical field in the atmosphere, altitude, humidity and temperature. Each unit was housed in a soccerball-sized styrofoam sphere covered in aluminum foil, and would be suspended from 50 feet of monofilament nylon line at intervals along the flying cable.

When our kites finally arrived, we had

no way to get to Christmas Island, so Ben arranged to fly us to South Point on the Big Island of Hawaii to do some test flights. South Point, the southernmost place in the U.S.A., turned out to be a wild point with 20-to-30-mph winds and extreme ground turbulence. There are 37 monster wind-powered electric generators sited here, which supply up to 20% of Hawaii's power needs. It was too difficult to launch the parafoils in the extremely turbulent wind conditions. We got around this by flying a 16-square-foot Flow Form to lift two telemetry units and managed to get in two days of experiments before returning home to Pennsylvania.

It was the next month before we got back into Honolulu; this time we made it without incident. The first day there, we took some time to try a test flight, despite the gusty winds. During one launch, we tried attaching windsocks to the inside corners of the half kites. Both inside corners ripped out. This illustrated the need for even more reinforcing. Priscilla Nagao of High Performance Kites in Honolulu offered her sewing shop to

repair and reinforce the kites. It just proves an old travel adage: never go anywhere you don't have friends! We had the kite fully repaired in time to catch our plane for Christmas Island.

From the air the Island appeared as a backward C-shape surrounding a beautiful lagoon. No other land was in sight. Christmas Island is almost 40 miles long, with a high point of 20 feet and covered with pampa grass and coconut trees. There are six villages, two churches, a school, boatyard, two banks, the famous Christmas Island post office, (get your Christmas stamps early!) and one hotel. The interesting town names are Poland, Paris, London and Banana!—the latter named for the banana plantation tried without success years ago. Despite high humidity, the island enjoys very comfortable weather, under the trees.

There are about 1,000 people living on the island, mostly emigrated from the Gilbert Islands. They make their living by commercial fishing, diving for aquarium fish, coconut and copra farming, all for export. The locals are universally friendly, helpful and easy to talk to.

The first day there we checked out the wind profile radar installation that the National Oceanic and Atmospheric Administration had built. It's the size of a football field with hundreds of six-foot poles connected by wires. It measures the windspeed by radar that can "scatter" sig-

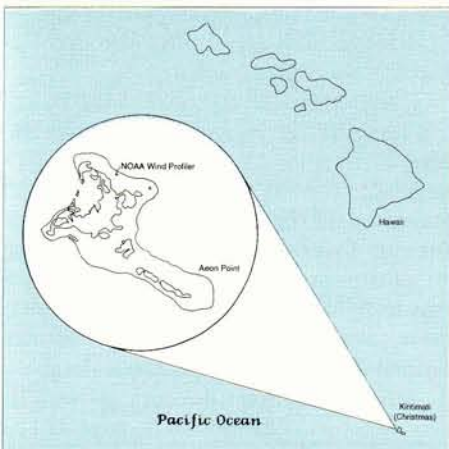


Illustration: Lisa Craig

nals off wind. Now that's incredible! An insulated and cooled structure at the site houses the electronics and computers that have been recording weather data for the last five years. Those records are collected and transmitted via satellite back to the U.S. National Weather Service for weather prediction models.

We took the 30-mile drive south to check out our flying site at the end of Aeon Field's runway. It was built in the late 1950s as a Royal Air Force refueling stop. The drive is an adventure itself through eight-foot high bright green bushes. The one-lane road winds along a rugged coral beach. Our view of the deep blue ocean and wild surf was beautiful but distracting. There were blind corners that could hide an oncoming vehicle beyond 20 feet. Luckily there never was any traffic. The south end of the island was deserted except for a few lone fishermen—we saw only two all week. What would pass for beaches are in reality coral graveyards. There are billions of pieces of gray dead coral all along the coast. It's the strangest beach you'll ever see and difficult to walk on. One fall and you'd need stitches; the coral is sharp and very hard.

The runway was in perfect condition, a clean gray-white color and flat as a table. My thermometer showed 90 to 110 degrees on the runway at high noon on most days. Add the humidity and it's not an easy climate to work in.

We hired some local men to dig holes to set concrete for mounting the winch pipes. The workers went to the beach a mile away and found enough driftwood to build a tent frame. They covered the frame with a big heavy green tarp. Into this telemetry tent, Ben and Chris installed the electronics, telemetry receiver, a pair of huge truck batteries for power and two computers to record the data from the telemetry packages.

Back on the runway, Joe and I got the kites out to untangle the bridles and set the flying angles. The ground winds proved difficult, particularly the thermals. We got some flight time in before dark and then planned what we would do the next day. We were particularly concerned about the difficulties we were facing in launching the kites. We later found that the kites needed around 1,000 feet of altitude to clear the thermals.

Before we returned to the hotel, we stopped to enjoy the night sky. Ben mentioned that, because the closest air pollu-

tion was 6,000 miles, this was one of the clearest night skies in the world. He was right. It was an explosion of fireflies at midnight in a coal mine. The Milky Way was glorious! Every so often a satellite passed. Shooting stars were clearly visible. We could tell shooting stars and satellites apart because shooting stars move across the sky *much* faster than satellites.

The next day at the runway brought more thermal-related launch difficulties. This was to be our challenge for the week. The kite would rise almost vertically and overfly the anchor point as it went up. We'd let out more cable trying to regain stability. The kite would overfly more and rotate 180 degrees only to crash nose-on with a terrible whoomph sound into the pampa. Fortunately our construction techniques were strong enough to keep from blowing out cells.



A winch beam mounting is quickly made of island scrap. It works!

Everything I've ever done in flying big parafoils seemed useless. The challenge was to adjust the bridles to get the optimum high flying angle. That made launching within the first few hundred feet an unstable proposition. We didn't want to add the windsocks because that would lower the flying angle, but eventually we had to. It worked partly because we had built the kites lighter than originally called for.

The bridle lines, (thin, no-stretch Spectra) were a new problem. We'd painstakingly daisy-chain them every night and carefully fold the kites, but it was still a drill every morning to clear the bridles. Finally I sewed a tubular sleeve for each kite's bridle, which helped prevent tangling.

To get the cells inflated on the ground, we used an old parafoil trick. We shifted the kite to the side, almost 90 degrees to the anchor point, laid the kite on its side and opened the cells one at a time. With the right timing, the entire kite inflated and flew into position immediately.

The next day we got the top parafoil up

about a quarter mile when disaster struck. The kite rose shakily on the thermals, slowly turned over and no matter how fast we let out cable it just wouldn't right itself. It collapsed and dove into the surf. Joe, Chris and Ben drove to the ocean while I stood by to winch in the cable. Joe and Chris got out to waist-high water while Ben swam out to the reef. He cut the shroud lines free of the reef to rescue the kite. Then they noticed there was a six-foot black tip shark circling them. They quickly scrambled back to shore. Joe, Chris and Ben had more nerve than I did. I would have said two words: "Goodbye kite!"

The rescued kite had a hole in an outboard cell (all the seams held up fine) and was unflyable. We decided to join one of the split kites together as a replacement top lifter. We'd fly one or two of the split halves in train underneath as originally planned. After reinforcing them with duct tape, I laboriously joined the two halves together by hand sewing.

Retrimming this kite with a new larger windsock was another challenge. Its line pull was around 75 pounds. This bucking bronco wasn't easy to hold. We all took turns holding onto it so Joe could make the angle changes. Chris took the outboard corner windsock lines and used them to steer and control the kite in ground winds. This proved an excellent ground

handling technique for the difficult conditions. We got the new top kite started into the wind, and up a few hundred feet. It was stable.

We discussed several ways to attach the eight telemetry units to the kite cable. Eventually, the simplest was the best. A little loop of nylon string, duct-taped to the flying cable, connected the 50-foot string leaders to the foil-covered spheres. It worked just fine. We let the Kevlar cable out about a mile high and the kite carried the load with no difficulty. We decided to let the lone kite stay up for the night as the data was still coming in.

Coming back to the field in the morning was exciting. When we finally saw the kite, it had shifted with the wind about 45 degrees to runway left. Nevertheless, it had stayed up all night with no problems. We decided to attach another kite to the cable to gain more altitude. The runway heat was really up and I carelessly wished for a little rain to cool us down. No sooner wished than said, a shower came along.

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Continued on page 43 . . .

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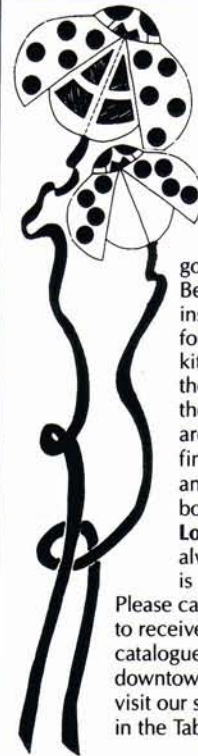
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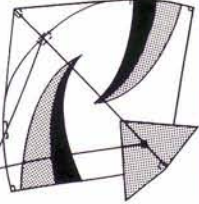
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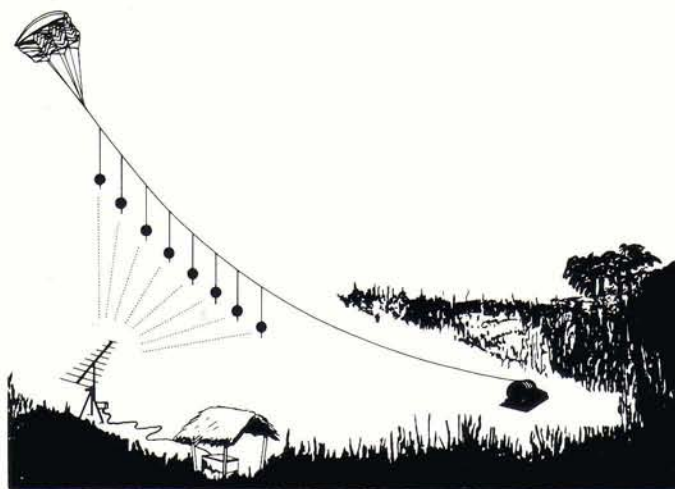


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Source information: Ben Batsley and Bill Tyrrell
Illustration: Lisa Craig

General scheme of how the kite and telemetry system works.

... Continued from page 40

when wet. The lower kite dropped into the ocean and couldn't be rescued. We attached another kite and got it flying.

Letting out cable over the winch was a choice of slow and deliberate or full speed ahead. The wind at the top kite was at a 45-degree angle from the ground wind. I began letting out cable but the lower kite had turned over. It was on its side and heading for the ocean. We trucked over only to see it immersed completely in deep rough breakers. Cooler heads prevailed this time: nobody went shark trolling to rescue it. Joe and Ben tried to pull the kite from the surf but its cable was cut by coral and the top kite was again flying alone. Back at the site we regrouped and decided to leave the kite up overnight again. It was now about a mile up with the telemetry still sending information perfectly.

I was wondering if there was some bad animal karma creating these crazy problem. We were constantly swatting flies coming in from the desert, a mother boobie bird next to us would never leave her young brood, and a dead cat was lying flat on our runway. Had we upset the order of nature? Had we driven over too many crabs?

The following day, September 24, was the next to the last one available to get the two-mile altitude needed to make all the data recordings. Arriving at the runway, we found the main kite still about a mile up, flying strong in the clouds.

Before we added the last kite, Joe found a small break in the cable, a cut from the coral. Technically, it may have held. You want to feel really nervous? The choices were: take a chance and leave the cable alone hoping it wouldn't break; or cut it in half and splice it as a new joint. I was more than a little nervous. I had never made an inline splice before. I took one look at my friends and cut it in half at the break. Now

they were nervous. In about five minutes, I had a splice I was confident with. We let the cable out very slowly. There was a real pregnant pause—but the line held. We gave a collective sigh. Relief was spelled GOOD SPLICE!

Joe adjusted the last kite to its proper angle. The ground winds were difficult to work in again. We needed a windsock but the larger ones were already used. However, there were three smaller ones left, experimental low drag models. I bridled them in a cluster of three with duct tape and string and tied their ends in knots to close them off. Tied onto the kite, they still didn't have enough drag or steering effect. Ben asked if weight would help. We had built the kites at the lightest weight possible and had an aversion to adding even a few ounces. What the hell, this called for a radical attitude change in us and the kites. We placed a piece of coral into one of the windsocks' closed ends. Chris again steered the kite by the windsocks till it was ready to let out. Beautiful!

The windsocks and coral weight lowered the kite's center of gravity just enough to overcome the effect of the rising heat. Joe eased the kite into the air on its own long tether to stay clear of the flying cable. We let it out and up very carefully. The two kites were in different wind patterns, a mile apart, so it was touch and go for some time. What was happening was that the main flying cable was pulled sideways between the top kite and the anchor. It looked as though the lower kite was flying off track. It actually had weathervaned into the ground winds making it fly sideways to the main cable. This was an advantage, flying off the side of the runway, out of the thermals! This had to be among the oddest kite flights ever.

the cable on the drum. Could this be right? Did the manufacturer have the promised 20,000 feet on the reel? Was

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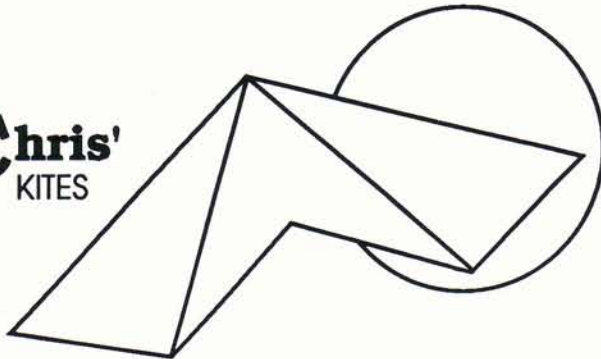
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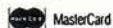


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... Continued

there a mistake? That just couldn't be four miles of Kevlar out there.

Well, it was. We could just barely see the last kite as a speck in the sky. It appeared to be flying at about one mile in altitude. I went out to the runway to check the windspeed. The wind profile radar was about 30 miles away but we had learned another way to gauge windspeed: we would pace the cloud shadows on the runway with a truck's speedometer. This turned out to be very accurate. I came back from the windspeed check to three very happy faces.

Chris: "Bill, guess how high."

Bill: "I don't know, about 7,000 feet?"

"Higher!"

"9,000?"

"Higher!"

"10,000?"

"Higher!"

"I can't stand it! How high?"

"11,400!"

Two miles above Christmas Island!

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We had met our goal for testing the system and we felt pretty high ourselves. We knew this was something that could work. Since then we've been "discovered" by a dozen magazines and newspapers (international, scientific and local). Now you're getting a kiter's view in *Kite Lines*.

Meanwhile new stages of work have been approved and new agencies are interested, but we're waiting for the paperwork to let us move ahead. Higher altitudes in such locations as Peru and Antarctica are being talked about. No doubt when we finally get the go-ahead the managers will want it done yesterday and we'll be in for another race into the wild blue yonder.

Joe and I were fortunate to have ideas, skills and help for this project from a number of interested kite people. Our sincerest thanks go to Chris Balsley, Bill Bigge, Red Braswell, Bevan Brown, Adrian Conn, Angela Dittmar, Mel and Val Govig, George Ham, Pete Ianuzzi, Domina Jalbert, Nat Kobitz, Bob Loera, Priscilla Nagao, Bob Price, Bill Rutiser, Bobby Stanfield, and my daughter Lisa. Many thanks to my wife Mary and Joe's wife Dixie for understanding the process and us. A big thank you to Ben Balsley for giving us the chance and having the patience to keep on going when the going got tough. —Bill Tyrrell

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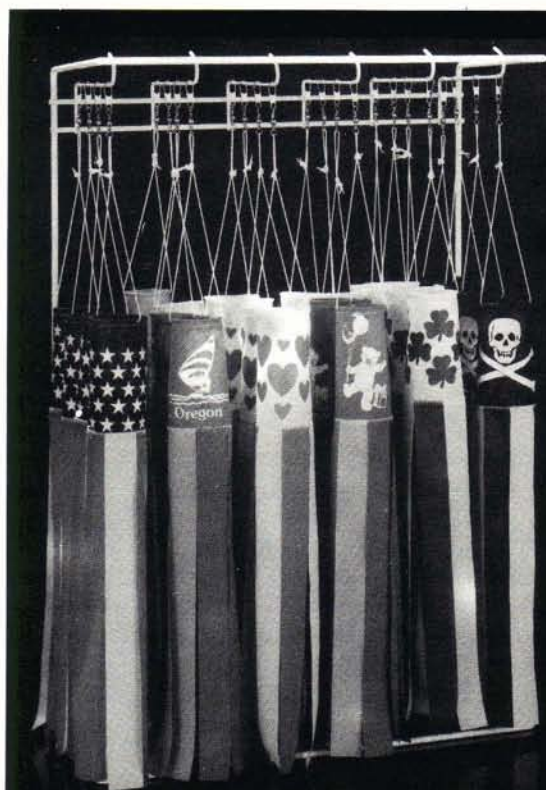
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World Class: Thailand

... Continued from page 32

This kept the ritual battles from being blocked by the large kites of the visitors, but it also meant that the Thai fliers were somewhat isolated from the social life.

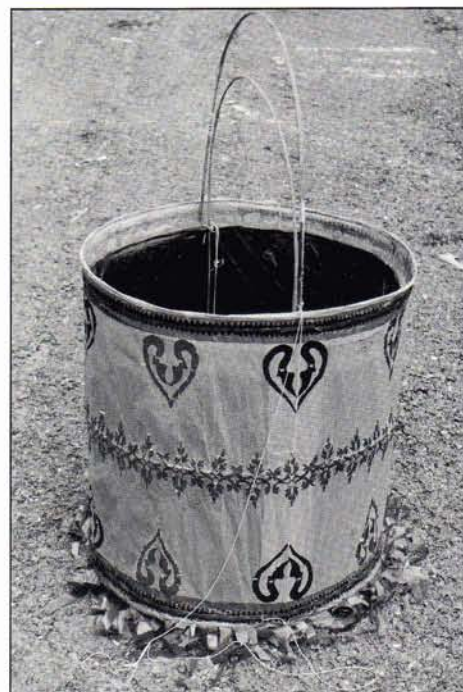
Drum Rolls, Please

The banquet at Bang Sai fit the occasion, a banquet to live in history as the most festive, well-planned gala in kite revelry. We had little time to refresh ourselves, and felt barely human after sponging off with bottled water and drying with our kites and handkerchiefs. It didn't matter once the festivities began. We were supremely honored guests.

A field with stage and tables was set up and floodlit for the 200 people on this balmy tropical night. Off to one side, three ultralight stunters, flown by Neil Taylor, Robert Loera and Tom Casselman, alternately lit up and disappeared as they wove in front of the spotlights. During cocktails, 10-foot hot-air balloons were launched at the corner of the grounds. The paper balloons carried a burning paraffin ring. About one in four caught fire and either didn't get aloft or came down in the trees and wires. (You could never get away with this in the States!) In the meantime, around the bonfire used to ignite the gondolas, the launchers danced to the rhythm of Shakib Gunn's cymbals and drum.

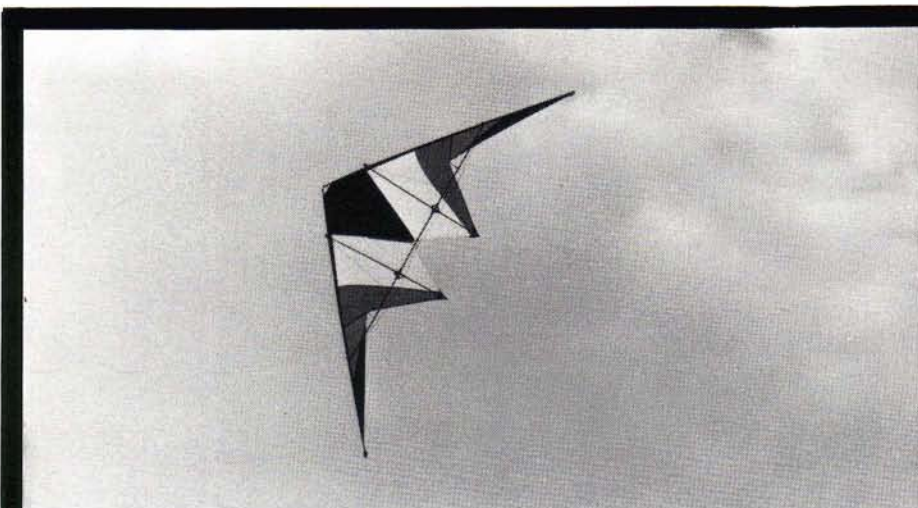
During dinner, Thai dancers, trained at Bang Sai, entertained to the hypnotic percussive rhythms of a gamelan orchestra. The awards and exchanges between hosts and guests included equal recognition for every flier. A final gift was from Joe Vaughan. He

Continued . . .



Bucket kite from Malaysia, similar to the Chinese lantern kite, flew well (seen at rest).

Mei Govig



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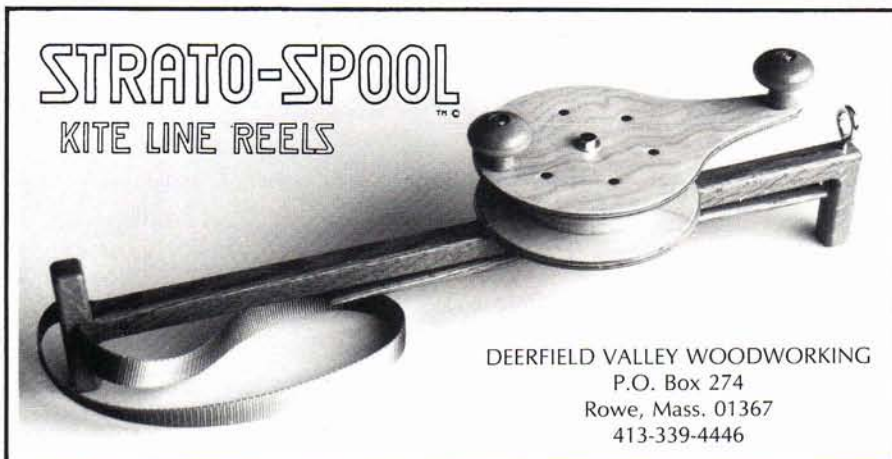
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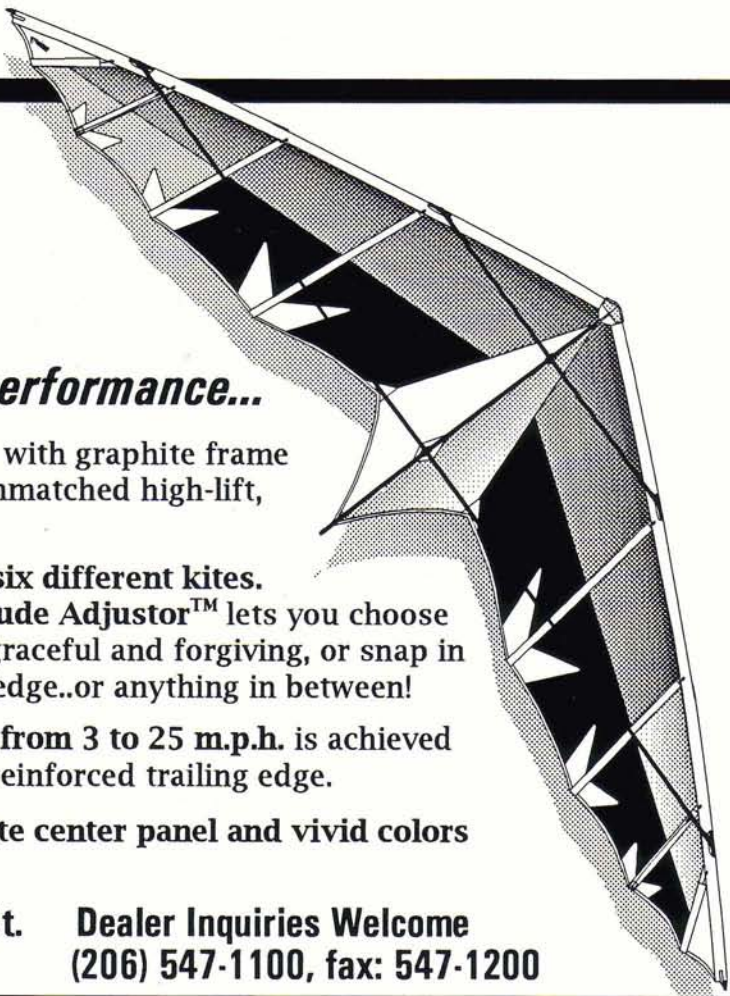
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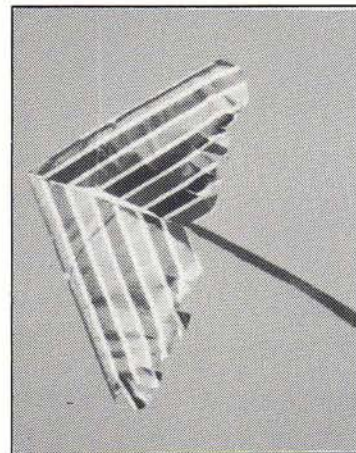
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... Continued

danced his Grandmaster fighter kite through the crowd, across the stage, even over the table in front of the governor. It was moving in every meaning of the word.

The banquet closed with the dancers pulling the guests onto the stage; everyone, even I, danced. A spectacular fireworks display finished the evening. As the well-traveled Tom Casselman said, "Balloons, dancing girls, orchestra, fireworks—what a fantastic finale!" We went back to the bus full of the greatness of the entire festival.

On to Satun

We traveled to Satun by way of the island of Tarutao (see story by George Peters on pages 28-29). Then we took part in the Thirteenth Annual Satun "International" Kite Festival.

For some this event might be called anticlimactic, and it was certainly incidental to the Thailand International Kite Festival, but those of us with a terminal case of kite curiosity were propelled into it.

For its first 12 years, this event took place between fliers from formerly warring towns within 125 miles (200 kilometers) of Satun. When the Malaysian border was pacified, this and other cultural exchanges replaced the conflicts of the '60s and '70s. Fittingly, the festival took place on an abandoned wartime airfield on the outskirts of town.

The opening ceremonies of the festival included a kite parade. It was the very best kite parade I have ever seen! (It was the only kite parade I have ever seen!) Not an Olympics-style parade around the kite field, this was a full-blown hours-long city parade through the streets of Satun, complete with marching bands, dancing girls, dragons and truck floats covered stem to stern with kites!

The second day it sprinkled and the third day it rained in the afternoon. Despite the rain's effect on the kites (especially the paper models of the local fliers), the festival was a success.

The international guests were given ample room out of the way of the local contestants, so we could fly and at the same time watch the Thai/Malaysian competitions.

A Contest Like No Other

In some ways, the Satun festival reminded me of so many that I have seen, from the Smithsonian in Washington, D.C. to the annual kite day in Austin, Texas. It had the flavor: piles of paperwork for the judges, too serious officials facing anxious contestants, and a fair measure of foul-ups that no one but the judges noticed.

At the same time this was a competition like no other. The complexity of the kites, the

flying skills and the judging are unique to this part of the world and appear to receive serious backing from the governments. To the Thais and the Malaysians, kites are more than a pastime; they are a heritage of perhaps 500 years.

There were four contests: for "high flight" (flight angle), "noise," beauty, and kitemaking. In addition, awards were given for the best anti-addiction poster kite and for the "ideal" (best flying) kite.

The flight angle and sound contests were real tests of the kites. Fliers were given five minutes to launch and then the kite had to stay aloft, *with no hands on the line*, for 10 minutes. All of the kites were 4 to 5 feet (1.2 to 1.5 meters) wide, flown on exactly 150 meters (492 ft) of line. These are very rigid rules for any competition. Try it yourself!—especially try to keep your hands off.

Unable to schedule an interpreter, I observed slightly handicapped. I did learn that different regions of southern Thailand and northern Malaysia make and fly variations of the *wau* (pronounced "wow," the general word for kite).

Though all the kites have the broad elliptical upper wing, they vary in the shape of the lower stabilizing wing. The best known is the Malaysian *wau bulan*, with a crescent moon shape as its lower wing. It often features elaborately cut layers of multicolor paper appliqué. In Satun, the lower wing takes the shape of a water buffalo's head and the kite is called *wau kwai*. Surface decorations are not the Satun style, but a special feature is a long curved extension with a "feather" (tassel-covered wire) at the head of the kite that allows the kiteflier to tune the kite to the winds.

For the flight angle contest, each contestant brought a handful of kites from which to choose. Competitors, in two-member teams, launched from lime-marked circles 110 yards (100 meters) apart with the full 150-meter line paid out. There were 10 numbered starting positions, and next to each of them a simple ruler on a stake was used to measure the flight angle.

The "noise" contest ran in a similar manner except that along with the handful of kites the contestant brought several hummers. Only one hummer was selected for attachment to the kite, since the rules booklet stated, "Each kite is allowed to use only one source of noise-making." Sound was judged on the basis of loudness and variation of tone.

The beauty and "ideal kite" awards were judged more subjectively, on the ground first and then in the air, like many other kite contests I've seen.

The kitemaking competition was un-
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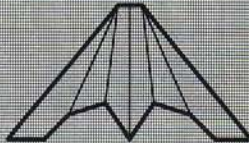
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usual. It took place over two days and involved building and flying a kite, *on site, from scratch*. Think about that! Would you be willing to have a crowd looking over your shoulder for two days, witnessing your every sliver and curse?—and *then* to fly and be judged?

The field was set up in the morning of the first day aligned with the prevailing wind. Three hours were occupied with getting through the paperwork. Then the wind had shifted almost 180 degrees, but the officials went ahead and launched by the original layout! The next day either the wind or the positions shifted because the contest went off with success—until the rains came.

Calling It a Day

Rained out ourselves the last afternoon, our tour group returned to our mountain retreat to dry our kites, wet our whistles and sing.

Throughout the trip to Satun, arrangements were made for the guests to stay in beautiful national parks, first at Tarutao and then at Talaybun, a mountainside lake 25 miles (40 kilometers) from Satun. Although some of us chose to stay in a hotel in Satun, those who went with our hosts' arrangements had a wonderful time, with the exception of a few, who found the accommodations a little rustic.

Before we knew it, we were on another long bus ride back to Bangkok and packing up for the long flight home.

A Positive Impression

Among the images that stayed with me from Thailand were the buildings at Bang Sai, with the look of army buildings, and the kite field at Satun, the tarmac of a former war time airfield. We in the West could do worse than to order armies to build craft centers and convert a few strategic bomber bases into kite fields. Additionally, sponsored native craft industry seems to work in Thailand; one wonders if it might not work as well in Liverpool, Warsaw or Detroit.

In the spirit of Bang Sai/Satun, Yaripa, One-Sky-One-World and the upcoming Kite Day International in South Africa, I think kites are becoming an important currency in the much-sought "peace dividend." Of all the "trends" signalled in Thailand, this was the most important for me.

Thailand gave me enough stories to fill a book, but I could only use these pages. My apologies to anyone I didn't meet as well as to anyone I met but didn't have space to mention.

—M.G.

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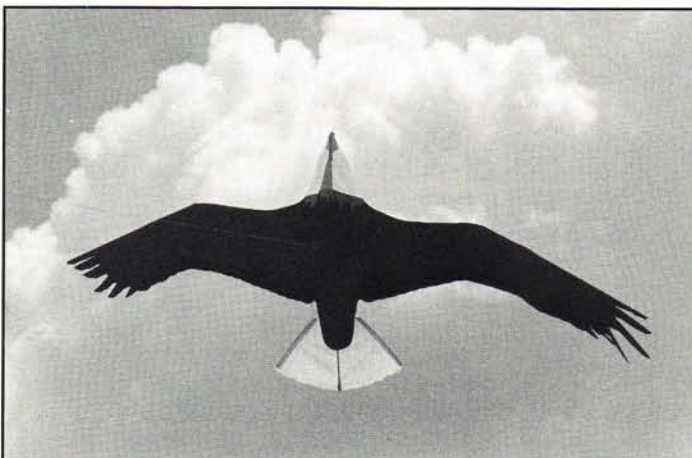
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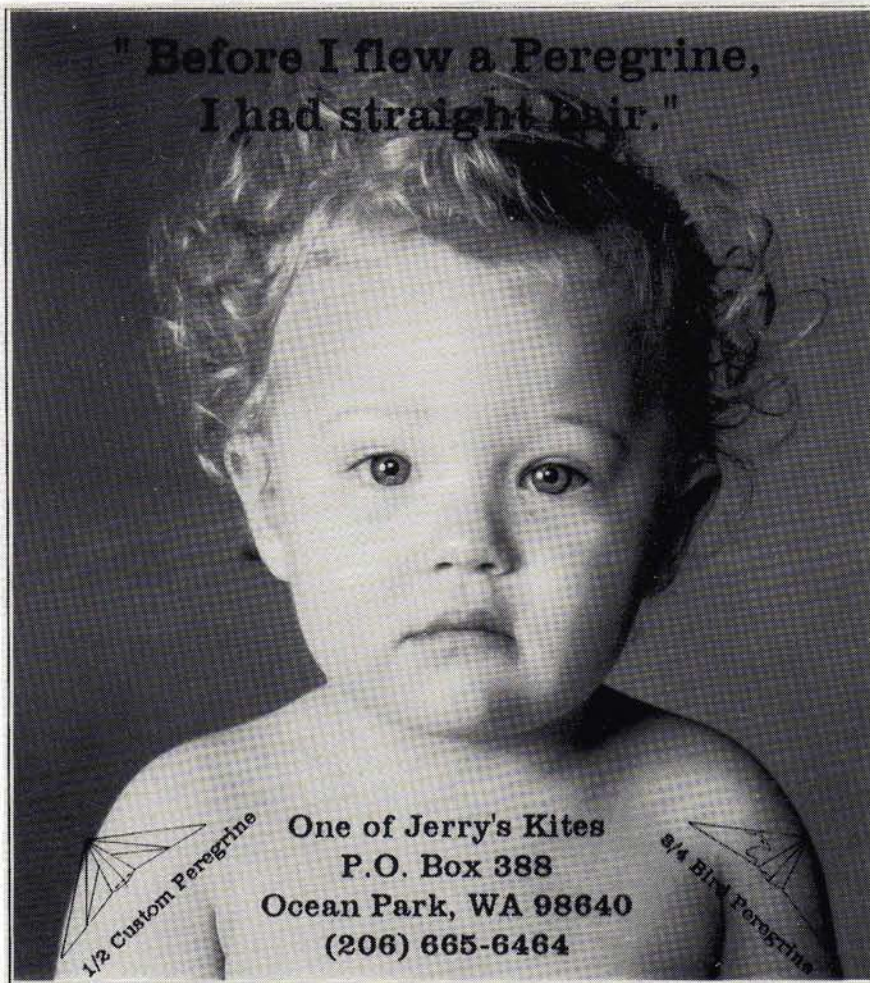
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COMPILED & ANNOTATED BY MICHAEL GRAVES

This survey is **not a review** of sport kites by Kite Lines magazine. It is strictly a compilation of ratings by pilots from around the world. The Kite Lines staff makes no judgments of any kind about the kites. Experienced, objective panelists provide the ratings that are compiled and annotated for publication by an outside specialist.

In case you hadn't noticed, the stunt kite market is growing at a frenetic pace. Almost weekly we hear of new kites becoming available and others disappearing altogether. Last year at this time our best guess was that there were about 150 models of stunt kites available. This year we know of at least 300.

For this our third survey, we again set out to review as many stunt kites as possible. The process began by assembling our test panel. Steps were taken to be sure that the panelists were not affiliated with any manufacturers or distributors. As usual, we lost a few review-

ers because during the year they had acquired business interests in the sport kite field.

It had been suggested that all the panelists gather together and share a large body of kites. Apart from the obvious impracticality of arranging all the travel for our wide geography, there is the question that consultation might occur among the panelists. So for now we have kept to our original format.

One of our goals in producing this year's survey was to increase the size of the panel of test pilots. To do this, we contacted as many clubs as we could and invited their members to become involved in reviewing the kites. This strategy increased our panel from 37 to over 140 fliers, and gave us a more geographically diverse group. Sport kite enthusiasts responded from 10 countries: Austria, Australia, Belgium, Canada, England, France, Germany, Italy, Norway and the United States. The level of experience within the panel varied considerably, from one year to 15 years, though the average test pilot had around five years of experience in the sport.

With such a vastly expanded panel, we expected and received many more reviews than in previous surveys. We wound up with 680 reviews, covering more than 200 models of sport kites. This quantity enabled us to set a new minimum number of reviewers (3) for inclusion of a kite in the ratings, which left us with 65 single kites and 7 trains listed.

With each successive survey, we revise our methods to more accurately acquire and present the opinions of the test pilots. Some readers will no doubt feel that the data presented is not as objective as it could be. Our goal in producing the survey is to present qualified opinions on as many kites as possible. With a large enough panel of test pilots there should be enough averaging of variables such as wind conditions, flying lines and experience to make their collective opinions valuable. With a few exceptions, all of the kites reviewed came from personal collections, making this as much a survey of what people buy as what they like to fly. It also necessarily runs behind the market and cannot show ratings for the very newest models now in production.

As in our previous surveys, we asked our test pilots to rate each kite they reviewed in a variety of areas of performance, including ease of assembly, ease of launch, ease of

landing, durability, maneuverability, straight speed, speed in turns, portability, visual appeal, workmanship and value. The performance of each kite was rated in these areas in a scale of 1 (least or worst) to 5 (most or best), averaged for each model of kite, and used to calculate a composite total score. Evaluators were also asked to rate each kite based on amount of noise, amount of pull, estimated wind range and amount of skill required to fly. Though the average pilot is interested in knowing about these attributes, it was felt that because they represented elements of either personal preference or outright guessing, they should not be included in calculating the total overall scores.

Feedback from earlier surveys suggested that the areas in which the panelists were rating the kites were not equally important. It was decided that *weighting* each characteristic would generate more accurate and useful total scores. To that end we asked each of our test pilots

to rate the importance of each characteristic that they would be evaluating. From their responses we developed a formula for calculating the total scores (*see box*). In the chart, the kites are listed in order of descending total score, grouped by type and size. While these groups are arbitrary, they serve to make comparison between similar models easier.

The process of compiling nearly 700 kite reviews was bound to turn up something interesting. Careful examination shows that more and more pilots are turning to kites with high-tech framing, though such kites remain more expensive than their fiberglass-equipped equivalents. Some fliers stated that they feel all stunt kites are too expensive, but still the bulk of the reviews were on kites that retail over \$140 US.

Ultralight designs are becoming more popular in most regions. In fact, over half of the kites in the large delta class could be termed ultralight. New ultralight medium deltas have been growing in popularity as well, offering value for the money.

For the first time we asked the test pilots to tell us about the materials and construc-

Characteristics	Influence on total score (%)
Maneuverability	10.93
Workmanship	10.70
Durability	10.23
Value for the money	10.00
Visual appeal	9.30
Speed in turns	9.07
Ease of landing	8.84
Ease of launch	8.60
Straight speed	8.14
Portability	7.21
Ease of assembly	6.98

FREQUENT COMMENTS

The survey offered pilots the opportunity to comment on kites beyond simple numeric scoring. Following are the comments most often heard, and the kites to which they apply.

Favorites for ballet

- High Fly Kite Co. Team High Fly Pro Am
- Wind Walker/Gayla Wasp A/C
- Aerialogics Cyborg VIII
- Flexifoil Int'l Scorpion

Favorites for edge work

- Skyward Kites NKB
- Wind Walker/Gayla Wasp
- Flexifoil Int'l Scorpion
- Julian Wolfe Patrick Big Brother

Favorites for light wind

- Highflyers Phantom Shadow
- Cerf-Volants Azur Spyro-Jet UL
- Flexifoil Int'l Ultraflex Super 10

Favorites for strong wind

- Flexifoil Int'l Stacker 6'
- Flexifoil Int'l Hot Shot 4'

Favorite "power" kites

- Top Of The Line Hawaiian Team Kite
- Kite Innovations Quadrifoil 25
- Frontier Kites Team Storm
- Flexifoil Int'l Super 10'
- Wolkenstürmer Paraflex

Singles

Total Score M'factorer, Model

Delta, Large

	Number of Fliers	Easy of Asmbly	Ease of Launch	Ease of Landing	Straight-Speed	Turn Speed	Maneuvr/Precis.	Durability	Portability	Visual Appeal	Workmanship	Wind Value	Wind (MPH)	Skill Req'd	Amount of Noise	Amount of Pull	
91.43	Overflots Black & Stripes	3	5.0	5.0	5.0	2.3	2.7	5.0	5.0	5.0	5.0	5.0	3 to 23	4.0	3.3	4.0	
90.11	Wind Walker/Gayla Wasp A/C	11	4.6	4.5	4.2	4.3	4.4	4.7	4.5	4.6	4.8	4.5	4.3	5 to 22	3.2	3.4	3.5
87.48	High Flyers Phantom Shadow	4	4.0	4.8	4.5	3.8	4.0	4.8	4.0	4.0	4.5	5.0	4.5	2 to 16	3.9	2.9	2.9
87.23	One Of Jerry's Kites Peregrine UL	4	4.3	4.3	4.5	3.5	4.0	4.5	4.8	4.5	4.5	4.8	4.3	4 to 18	2.8	4.3	3.3
86.52	Frontier KitesTeam Storm	4	4.0	4.8	4.5	3.3	3.5	4.5	4.5	4.3	4.8	4.8	4.5	4 to 29	3.3	3.5	4.0
85.10	Hyperkites Elite Freestyle	3	5.0	3.7	4.3	4.0	4.0	4.3	4.0	4.7	4.3	4.3	4.3	6 to 20	3.0	3.0	2.0
84.75	Skyburner Sport Kites Skyburner	5	4.0	4.6	4.0	3.8	4.2	4.8	4.0	3.6	4.0	4.8	4.4	4 to 21	3.2	4.3	3.4
83.66	Sky Delight Kites Neptune	13	3.4	4.2	4.1	3.7	4.2	4.5	4.0	3.8	4.9	4.8	4.0	4 to 19	3.2	3.5	3.0
83.51	Jordan Air Pro	4	4.0	4.8	4.5	4.0	3.5	4.3	3.8	3.8	4.3	4.8	4.3	3 to 18	3.5	1.0	2.5
83.05	Chicago Fire Kite Co. Bee	10	4.1	4.4	4.3	3.8	4.3	4.4	3.3	3.9	4.9	4.7	3.8	3 to 21	3.3	3.8	2.8
82.75	Top Of The Line North Shore Radical	21	4.0	4.6	4.4	3.9	4.1	4.1	4.0	4.0	4.5	4.1	3.8	4 to 20	3.6	3.8	4.0
82.45	High Flyers Phantom	20	4.0	4.7	4.3	3.8	4.0	4.7	3.6	4.0	4.3	4.3	3.7	3 to 18	3.1	3.5	3.3
82.39	Flexifoil Scorpion	5	3.6	4.6	4.4	3.6	3.6	4.4	4.0	3.8	4.6	4.6	3.8	3 to 18	3.5	2.2	2.6
81.78	High Fly Kite Co. Team High Fly Pro Am	19	4.3	4.6	4.4	3.2	3.6	4.4	4.2	3.9	4.2	4.3	3.9	3 to 21	2.6	3.0	2.5
81.14	One of Jerry's Kites Peregrine	4	4.0	4.5	4.6	3.5	3.5	4.0	4.0	4.3	4.3	4.5	3.5	7 to 26	3.0	3.0	3.5
80.90	R-Kites Exocet	4	3.3	4.3	4.5	4.0	4.8	5.0	3.0	3.0	4.0	4.5	3.8	6 to 24	3.8	2.8	3.5
80.80	Top Of The Line Spin-Off	24	4.3	4.3	4.1	3.7	3.9	4.1	4.1	3.8	3.6	4.2	4.2	7 to 23	2.8	3.4	3.6
80.12	Julian Wolfe Patrick Big Brother	6	4.0	4.8	4.8	3.3	4.3	4.8	4.2	3.3	3.8	4.0	2.4	3 to 23	3.0	2.0	2.5
79.60	Stinger Kite Co. Stinger 1000	4	3.8	4.8	4.8	3.0	3.0	4.0	4.0	3.5	4.3	4.3	4.3	3 to 19	2.5	3.0	3.3
78.81	Wind Walker Wasp	6	3.2	4.7	4.0	4.0	4.3	4.5	3.5	3.2	4.0	4.2	3.5	6 to 23	3.5	3.7	4.0
78.16	Top Of The Line Spin-Off UL	3	4.3	4.0	4.3	3.7	4.0	4.0	3.7	3.7	3.3	4.3	3.7	5 to 12	3.7	3.3	3.0
77.10	Top Of The Line Hawaiian Team	24	4.0	4.4	4.1	3.1	2.8	3.4	4.2	3.7	4.2	4.4	3.9	7 to 24	3.1	3.6	4.2
76.81	Skyward Kites NBK	7	3.0	4.1	4.4	3.7	4.6	4.6	3.6	3.4	3.6	3.1	3.9	6 to 26	3.6	4.4	2.9
75.75	Aerialogics Cyborg VIII	3	2.0	4.0	4.3	3.7	4.0	3.7	3.7	4.0	4.3	3.7	4.0	4 to 19	3.7	3.0	2.3
74.68	Cerf-Volants Azur Spyro-Jet Freestyle	3	3.7	3.0	3.0	3.3	4.3	3.3	4.0	4.3	4.0	4.7	3.3	5 to 27	3.7	2.3	4.0
73.69	Ram Jet Kites Turbo Jet	3	3.0	3.7	4.3	3.3	3.7	3.7	3.3	3.7	4.0	4.0	3.7	4 to 18	3.0	3.7	3.3
73.26	Tim Benson High Profile	3	2.7	4.7	5.0	2.2	4.3	4.3	3.3	2.7	4.7	3.3	2.7	4 to 20	3.3	2.3	2.7
72.95	Action Kites Fire Dart	14	3.7	3.8	3.6	3.7	3.9	4.0	3.4	3.6	3.9	3.1	3.5	5 to 19	3.1	3.9	3.1
71.61	Banshee Kite Co. Scimitar	9	1.5	3.9	3.8	3.3	4.0	3.3	3.1	3.4	4.4	4.1	3.9	6 to 23	3.4	2.2	2.4
70.40	The Kite Store Liteflite	7	4.3	4.4	1.7	3.0	3.4	4.0	3.4	4.1	3.1	3.7	3.6	2 to 12	3.3	2.3	2.6
68.15	Spectra Sport Slingshot	7	3.4	3.9	3.6	2.7	2.8	3.3	3.3	3.4	3.4	3.6	4.0	7 to 25	2.9	3.9	4.0
55.53	Highly Strung Kites Check-mate	3	1.3	3.0	2.3	2.7	3.3	2.7	3.0	2.7	2.7	4.0	2.3	9 to 23	3.0	2.0	2.7

Delta, Medium

92.22	High Fly Kite Co. El Nino	4	5.0	4.8	4.3	4.0	4.8	4.8	4.3	4.8	4.8	4.8	4.8	3 to 28	3.5	3.0	3.3
89.30	High Flyers Bantam	3	4.3	4.3	3.7	5.0	4.7	5.0	4.3	4.3	5.0	5.0	3.3	5 to 32	3.8	4.0	3.0
87.90	One Of Jerry's Kites 3/4 Peregrine	4	4.3	4.5	4.0	4.3	4.5	4.5	4.5	4.3	4.3	4.5	4.5	4 to 25	3.3	3.3	2.5
87.80	Rare Air Kites Sky Rat	3	4.3	5.0	4.3	4.3	4.7	4.7	4.0	4.3	4.0	4.0	4.7	8 to 28	3.0	4.7	2.0
86.61	Bob Childs Wizard	6	4.2	4.2	3.7	4.5	4.8	4.7	4.3	4.3	3.8	4.3	4.7	5 to 23	2.8	4.2	3.0
86.18	Top Of The Line North Shore Extreme	15	4.3	4.3	4.0	4.5	4.4	4.5	4.1	4.4	4.1	4.5	4.3	4 to 21	3.7	3.1	2.9
84.31	Tim Benson Scorcher	4	3.8	2.5	2.8	5.0	5.0	5.0	4.0	4.3	4.8	4.5	4.5	10 to 28	4.5	4.8	4.0
82.85	Catch The Wind Spider Wing II	3	3.7	4.0	3.7	4.3	4.3	4.0	3.7	5.0	4.3	4.3	4.3	4 to 16	3.3	2.7	2.7
82.56	Action Kites Moon Dart	3	4.0	4.3	3.3	3.7	3.7	4.3	4.0	4.7	5.0	4.7	3.7	9 to 27	3.0	3.7	3.0
78.41	Action Kite Co. No Na Me	5	3.6	3.4	3.0	4.2	4.2	3.8	4.0	4.2	4.2	4.4	4.0	9 to 36	3.4	4.4	3.0
77.80	The Kite Store Liteflite Heavy	4	4.3	3.7	3.0	5.0	4.7	4.3	3.7	4.3	3.7	3.5	3.0	8 to 30	4.0	2.3	3.3
77.71	Cerfs-volants Azur Spyrojet UL	6	4.3	3.3	3.2	3.8	4.5	4.2	3.8	3.7	4.2	4.3	3.3	5 to 17	4.2	1.7	1.7
76.35	Hyperkites Hot Wing	4	4.0	3.3	2.8	4.3	4.0	4.8	3.5	4.5	3.0	3.8	4.3	6 to 26	3.0	3.0	1.8
74.28	Sky Magic Merlin	5	3.8	3.4	3.4	3.8	4.4	4.4	4.0	3.8	2.8	3.8	3.2	4 to 23	3.6	2.4	2.6
67.62	Go Fly A Kite 2200CC	4	4.0	4.0	3.0	3.3	3.8	3.5	3.8	3.0	2.3	3.0	3.8	8 to 23	3.0	3.5	4.0
67.52	Action Kites Sky Dart	3	4.0	3.7	3.3	3.7	3.7	3.3	2.3	4.0	3.3	3.0	3.3	8 to 28	2.7	3.0	2.7

Delta, Small

84.08	Catch The Wind SpiderMite	3	5.0	2.7	3.0	4.3	4.3	4.7	4.7	5.0	4.0	4.0	4.7	5 to 22	4.3	3.0	2.0
79.62	Vlieger-Op Speedwing 48	6	4.5	3.7	2.7	4.3	4.0	4.0	4.3	4.8	3.5	4.2	4.0	5 to 27	3.2	3.5	3.3
63.29	Skynasaur Aerobat	3	4.0	2.0	1.7	2.3	2.3	2.3	4.7	4.7	3.7	3.0	4.3	8 to 22	1.3	2.3	1.7

Diamond, Large

65.43	Peter Powell 4' Nylon	5	4.4	3.4	3.2	2.4	2.4	2.6	3.6	3.6	2.8	3.4	4.4	9 to 25	2.0	2.0	2.2
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Diamond, Medium

74.03	Trlby Poly	4	4.3	4.5	4.0	2.7	2.5	3.0	4.0	3.3	3.8	4.3	5.0	7 to 24	2.0	2.0	1.8
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Foil, Large

81.22	Flexifoil Int'l Ultraflex Super 10'	5	4.8	3.2	3.2	4.4	3.6	3.6	4.2	4.4	4.4	4.8	4.2	1 to 20	3.4	1.0	4.6
78.81	Flexifoil Int'l Pro Team 8'	3	4.7	3.7	3.3	4.3	3.3	3.3	4.7	4.7	3.7	4.3	3.7	7 to 32	3.0	1.3	4.0
74.48	Flexifoil Int'l Super 10'	8	4.6	2.6	2.8	4.4	3.3	2.9	4.4	4.5	3.8	4.3	3.9	6 to 29	3.4	1.1	5.0

Foil, Medium

81.65	Flexifoil Int'l Stacker 6' Splitz	5	4.4	2.2	3.5	4.5	4.4	3.9	4.6	4.4	4.6	4.2	4.2	8 to 34	3.6	1.0	3.5
78.43	Wolkensturmer Paraflex	14	5.0	3.5	3.2	3.6	3.7	3.9	4.4	4.9	3.6	4.2	3.5	6 to 30	3.1	1.4	3.5
74.30	Flexifoil Int'l Stacker 6'	18	4.5	2.4	3.4	4.6	3.8	3.4	4.0	4.2	3.4	4.1	3.5	8 to 29	3.3	1.1	3.7

Foil, Small

82.86	Flexifoil Int'l Hot Shot 4'	11	4.9	3.3	3.4	4.7	4.5	4.2	4.6	4.6	3.5	4.3	3.8	9 to 34	3.3	1.2	1.9
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Trains

Total Score, M'facturer, Model	Number of Fliers	Average Stack	Easy of Asmbly	Ease of Launch	Ease of Landing	Straight Speed	Turn Speed	Maneuvr/Precis.	Durability	Portability	Visual Appeal	Workmanship	Value	Wind (MPH)	Skill Req'd	Amount of Noise	Amount of Pull
Delta																	
66.25 Vlieger-Op Speedwing	3	3	2.7	2.7	1.7	4.3	3.0	3.0	3.7	4.0	4.0	4.0	3.3	5 to 30	3.0	5.0	5.0
Diamond																	
82.30 Jones Airfoils Mirage	8	3	3.9	3.9	4.3	3.6	3.5	4.6	4.1	4.1	4.5	4.3	4.3	8 to 31	3.3	2.3	2.3
71.08 Trlby Poly	11	11	3.7	3.4	3.5	2.5	2.8	3.1	3.5	3.5	4.5	3.9	4.6	8 to 21	2.4	2.2	2.9
68.37 Coast Kites Rainbow	8	7	1.8	2.1	2.6	3.1	3.4	3.5	3.8	3.3	5.0	4.4	3.9	8 to 24	3.0	2.4	3.1
Foil																	
82.84 Flexifoil Int'l Hot Shot 4'	6	4	5.0	3.2	3.5	5.0	4.7	4.3	4.5	4.3	3.7	3.8	3.8	11 to 43	3.0	1.0	3.5
73.18 Flexifoil Int'l Stacker 6'	9	5	3.8	2.4	2.7	3.8	3.2	3.1	4.6	3.6	4.8	4.6	3.6	7 to 27	4.0	1.3	4.4
72.90 Flexifoil Int'l Super 10'	3	4	4.0	3.3	3.3	4.0	3.0	2.3	4.3	4.0	4.3	4.3	3.3	4 to 32	4.3	1.3	5.0

Quads

Total Score M'facturer, Model	Number of Fliers	Easy of Asmbly	Ease of Launch	Ease of Landing	Straight Speed	Turn Speed	Maneuvr/Precis.	Durability	Portability	Visual Appeal	Workmanship	Value	Wind (MPH)	Skill Req'd	Amount of Noise	Amount of Pull	
Quad																	
83.15 Revolution Kites Revolution 2	17	4.3	4.4	4.6	3.9	4.4	4.6	3.9	3.9	4.4	3.7	4.0	3.5	7 to 25	4.3	2.2	2.8
82.49 Kite Innovations Quadrifoil 25	6	4.7	4.7	4.7	2.2	3.0	4.3	4.7	5.0	3.5	4.7	4.0	4.0	3 to 23	2.7	1.2	4.0
81.82 Revolution Kites Revolution 1	15	4.0	4.5	4.5	2.9	3.9	4.6	4.1	4.4	3.9	4.4	3.7	3.7	7 to 22	4.4	2.3	3.7
70.86 Peter Powell Omni	7	3.4	4.0	4.3	3.0	4.0	3.7	3.0	3.9	3.3	2.9	3.7	3.7	7 to 23	4.1	1.7	2.6

TOP 10 LEAST SKILL REQUIRED

Skynasaur	Aerobat
Peter Powell	4' Nylon
Trlby	Poly
Stinger Kite Co.	Stinger 1000
High Fly Kite Co.	Team High Fly Pro Am
Action Kites	Sky Dart
One Of Jerry's Kites	Peregrine UL
Top Of The Line	Spin-off
Bob Childs	Wizard
Spectra Sport	Sling Shot

TOP 10 MOST SKILL REQUIRED

Tim Benson	Scorcher
Revolution Kites	Revolution I
Catch The Wind	SpiderMite
Revolution Kites	Revolution II
Cerfs-volants Azur	Spyrojet UL
Peter Powell	Omni
Overflots	Black & Stripes
The Kite Store	Lite Flite Heavy
High Flyers	Phantom Shadow
R-Kites	Exocet (TIED)
High Flyers	Bantam

TOP 10 SINGLE KITES

High Fly Kite Co.	El Nino
Overflots	Black & Stripes
Wind Walker	Wasp A/C
High Flyers	Bantam
One Of Jerry's Kites	½ Peregrine
High Flyers	Phantom Shadow
One Of Jerry's Kites	Peregrine UL
Bob Childs	Wizard
Frontier Kites	Team Storm
Top Of The Line	North Shore Extreme

tion of each kite they reviewed. While the results were less insightful than expected, we did turn up some useful data. Most pilots were aware of the type of frame in each kite, either carbon composite or fiberglass, but only a small group distinguished between brands. Easton aluminum/carbon framing was the brand most often noted by the reviewers, though pultruded carbon framing was more common overall. Nine of the top 10 single kites in this year's survey had advanced composite frames.

The questions we posed in the area of sail construction yielded less defined results. While some reviewers suggested specific improvements to certain kites, most felt that the quality of construction was at least adequate. Those kites that stood out for

their construction earned very high workmanship ratings.

We must point out that the standards for rating the kites are derived from performance elements recognized in competition. Not every flier, perhaps not most fliers, is concerned with winning the next battle to make a perfect square inside a perfect circle. Many pilots prefer easy flying, pure fun or mainly aesthetic impact. For example, tails may be added to intensify visual appeal, even if tails put a drag on maneuvers.

Further, the great variety of kites today—to fit every taste and every pocketbook—makes it clear that a comparison study like this survey should not govern a flier's choice of kite. It might help the pilot choose, but personal preferences should be the only

standard. For most of you, then, the total scores of the kites may be of less interest than particular scores in the aspects that are important to you.

As the first impartial survey-taker on kiting, *Kite Lines* strives to be honest, open and unbiased, with all our procedures visible. We work always to improve and in the process to shed some light on the current state of the stunt kite market.

Special thanks go to all the pilots on our panel for braving the winter winds to meet our deadlines. We thank them, too, for being anonymous in these pages. (The expansion of the panel of evaluators made it impractical to list names this year.) We look forward to next year's survey, with many more new and interesting kites to fly. ♦

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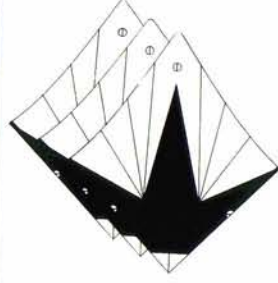
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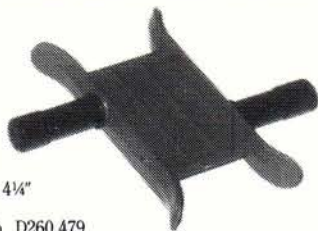
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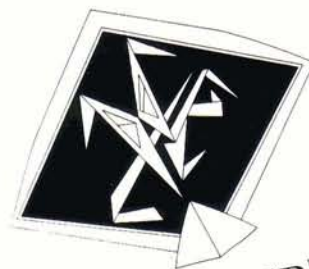


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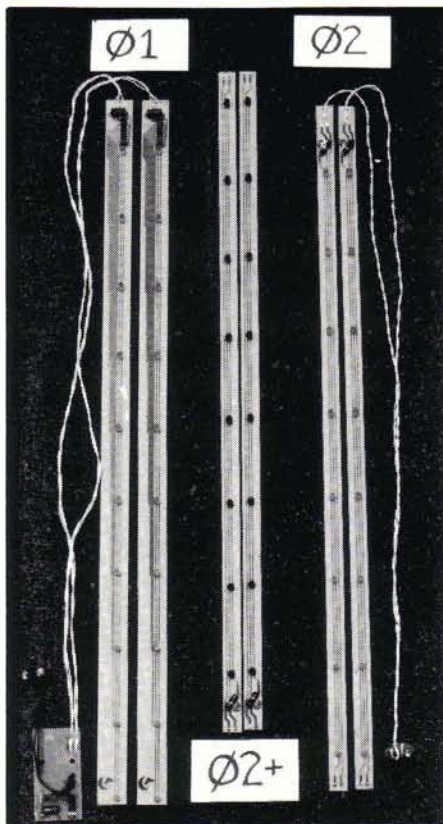
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JAPAN . . .



Edo Dako (Edo Kites) by Masaaki Modegi, in Japanese and English. Elegant, full-color pictorial tribute to Shingo Modegi (Masaaki's father) and recently deceased master kitemaker Teizo Hashimoto. Included are a brief history of Japanese kites and five types of Edo. Beautiful design and printing on heavy paper. Hardcover, 78 pp., \$59.95



Bessatsu Bijutsu Techo (Fine Arts Journal), in Japanese. Originally the Winter 1982 issue of a quarterly art magazine. This issue, devoted entirely to kites, is now published as a book. Thick and substantial, it contains more than 300 excellent color photographs of kites and kitemaking showing great detail, plus drawings and articles by well-known Japanese kite authors. Softcover (in a protective plastic sleeve), 216 pp., \$27.95

Majiku Dako (Magic Kites) by Takaji Kuroda, in Japanese. Innovative "cubic" kites that assemble many ways, convertible boxes that flip in flight, fly upside down. Designs include sleds and rokkakus. Color photos. Softcover, 77 pp., \$21.95

Ana Aki Dako, Paneru Dako (Vented Cellular Kites, Panel Kites) by Eiji Ohashi, in Japanese. Creative new configurations of the used-to-be-basic box: circles, triangles, lantern-types, and how to multiply cells. Color photographs and excellent drawings. Softcover, 60 pp., \$21.95



Tezukuri Omoshiro Dako Nyumon (A Primer of Interesting Handmade Kites) by Eiji Ohashi, in Japanese. Easy-to-make figure and cellular kites plus Ohashi's famous arch train. Color photos, many drawings. Tips on bamboo, painting, hummers, bridling. Softcover, 100 pp., \$21.95



Arte en el Cielo (Art in the Sky), by Paul Eubel and Ikuko Matsumoto, in Spanish and English. Revised edition of *Bilder für den Himmel (Pictures for the Sky)*. Incredibly beautiful full-page, full-color photos of one-of-a-kind kites made for the traveling exhibition. Includes the work of 100 international artists collaborating with 36 Japanese kitemakers. Softcover, 406 pp., \$54.95 (no airmail shipping)



Majiku Dako (Magic Kites) by Takaji Kuroda, in Japanese. Innovative "cubic" kites that assemble many ways, convertible boxes that flip in flight, fly upside down. Designs include sleds and rokkakus. Color photos. Softcover, 77 pp., \$21.95



AUSTRALIA . . .



Make Mine Fly by Helen Bushell. New 1988 edition has a far-ranging collection of tips, techniques, hints and advice (gathered since 1977) for beginners or experts, groups or individuals. Includes plans for the famous patented Trefoil Delta with folded keel, plus numerous paper kites. Softcover, 90 pp., \$12.95



Kites for Crowds of Kids by Ed Baxter and Richard Davey. Clear plans for 11 workable kites plus accessories. Good advice for workshops despite outdated references and regional (Australian) materials and resources. Nice drawings, no photos. Softcover, 24 pp., \$3.95



Kite-Folds by Beth Matthews. This improved second edition contains plans for 12 small kites, each made from a single sheet of paper, plus the "Skyvelope." Most are easy to make, all are attractive and clever. Clear instructions, lovely color photos. Addendum on kites in education is excellent. Softcover, 26 pp., \$9.95

BERMUDA . . .

Bermuda Kites by Frank Watlington. Plans for five island kites, plus variations and hummers, using traditional methods and materials (flour-and-water glue). Nice drawings, a little history and lots of charm. Softcover, 24 pp., \$4.95



BRAZIL . . .

NEW! Arte de Fazer Pipas (The Art of Kitemaking) by Silvio Voce, in Portuguese. Friendly history and construction of a baker's dozen easy paper kites, about half of them "modern" and the rest traditional Brazilian kites. Color photographs throughout, simple drawings. Has glossary. Softcover, 50 pages, \$4.95



CANADA . . .

Kite Crazy (the book) by Carol Thomas. To accompany the Canadian video series, this wire-bound book includes plans for Kiskede, rokkaku, dual- and quad-line deltas. Black-and-white drawings. Softcover, 176 pages, \$29.95

Kite Crazy (the video) by SOMA Film & Video, Canada. Meet famous kites and learn how to make and fly maneuverable kites (1-, 2- and 4-line). Beautiful photography, good instructions. VHS format, 102 minutes, \$29.95

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CANADA continued . . .



Fishing for Angels: The Magic of Kites by David Evans. A very colorful and attractive book for "readers ages 10 and up." Interesting and amusing kite lore and flying tips, but the three kite plans are best avoided. Softcover, 63 pp., \$14.95



Go Fly a Kite: The Kite Builder's Manual by John C. Boxtel. Novel plans include Ship, Windmill, Eagle. Line drawings are pleasing, but lack dimensions. Out-of-date materials and techniques. Softcover, 80 pp., \$12.95

CHINA . . .



Chinese Artistic Kites by Ha Kuiming and Ha Yiqi. Detailed description of the celebrated kites of the Ha family of Beijing. Covers history, evolution, structure, decoration and flying. Over 80 kites plus accessories. Luxuriously printed color. Good English translation. Softcover, 160 pp., \$16.95

SPECIAL PURCHASES!



Edo Dako Dai Zenshu (The Big Complete Book of Edo Kites) by Masaaki Modegi, in Japanese (and some English). One of the most exquisite works of kite literature yet from Japan. About 140 kites lavishly photographed and cataloged. Excellent construction detail drawings. Rich printing on heavy paper, elegantly bound and boxed. Hardcover, 159 pages, \$159.95 (no airmail shipping)

The UNITED STATES . . .

The Penguin Book of Kites by David Pelham. Called "The Bible," first published in 1976 and still recommended for all kitefliers. Plans for more than 100 kites plus lots of solid reference data, aerodynamics and history. Color. (Hard users: buy two—the binding dies.) Softcover, 228 pp., \$12.95



The Stunt Kite Book by Alison Fujino and Benjamin Ruhe. Covers background, personalities and introduction well; treats nuts-and-bolts somewhat sketchily. Many black-and-white photos and drawings and a useful chart of 80 brands of stunt kites listed by skill level. Softcover, 110 pp., \$8.95



Stunt Kites! by David Gomberg, 3rd edition. The first book on the subject. Thorough coverage of the basics plus advanced techniques. Tips and information from 22 well-known pilots; lots of safety pointers. "Homemade" publishing with computer drawings, no photographs. Softcover, 88 pp., \$8.95



Art That Flies by Tal Streeter and Pamela Houk. An anthology of unusual kites from the Dayton (Ohio) Art Institute exhibition by artists Curt Asker (Sweden), Jackie Matisse (France) and Tal Streeter (USA). Optical illusions and environmental objects. Interviews, artists' statements and an interesting bibliography. Many handsome photos, some in color. No plans. Softcover, 139 pp., \$12.95



The Art of the Japanese Kite by Tal Streeter. Rare up-close and personal profiles of Japan's master kite artists sensitively interviewed in 1971-72. Includes 130 outstanding photos (52 in color). Rich contemporary history. No kite plans, but a true joy to read. Softcover, 181 pp., \$24.95



NEW! *The Ultimate Kite Book* by Paul and Helene Morgan. If it weren't for the exaggerated title, this would be a pretty good book. It's done with great color and splash to attract newcomers, but lacks depth and identification of kitemakers. Unusually extensive photographs showing flying techniques. Contains about six plans for easy kites, including a Tumbling Star. Hardcover, 122 pp., \$19.95

The revised second edition of *Kiteworks* by Maxwell Eden. An impressive collection of 50 kite plans from respected designers. Up-to-date on materials. Detailed drawings plus tips, techniques, accessories, historic chapters and (un)related stories. Big, colorful, ambitious—but unclear in some places. Softcover, 287 pp., \$14.95 Original hardcover, 287 pp., \$24.95 (no airmail for hardcover)



Fighter Kites by Philippe Gallot. Plans for 29 kites, plus tips on flying, tools, materials, games and accessories. Illustrations are large and clear. Photos are good. Instructions are adequate, but measurements converted from metric may total incorrectly. Softcover, 96 pp., \$12.95



NEW! *The Fighter Kite Book!* by David Gomberg. A goodly amount of information, mostly correct, about fighter kite flying. Though inelegantly compiled (grammatical errors, homemade format, no photographs) and conveying little enthusiasm, it's useful as a starting source. Softcover, 74 pp. \$8.95.



Kites for Everyone by Margaret Greger. Good kite plans, variations and accessories, plus knowledgeable tips and techniques for beginner, expert or classroom. Second edition. Softcover, 136 pp., \$12.95

More Kites for Everyone by Margaret Greger. Some old kites, some new kites, plus tips and techniques based on years of experience. Plans for 17 kites from simple to complex. Softcover, 59 pp., \$9.95



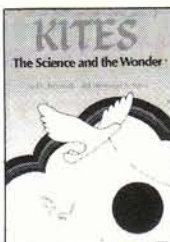
One-Hour Kites by Jim Rowlands. Same as *British Kites to Make and Fly*. Standard kites for beginners, plus a few new ones, but directions are skimpy. Literature and supplier lists. Softcover, 95 pp., \$12.95

The Big Book of Kites by Jim Rowlands. Same as *British Making and Flying Modern Kites*. Uneven instructions and drawings for 36 kites. Includes a book list. Softcover, 127 pp., \$12.95

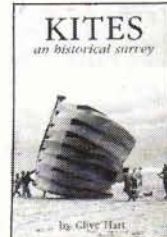
Flight Patterns by Leland Toy (from a television kitemaking series, 1984), 2nd edition. Solid fundamental tips and easy plans for eight kites presented in order of difficulty. Plans include a rotor made of foam meat trays and a Mylar fighter, plus fighting strategies. Unpretentious, free of errors, user-friendly and easy to understand. Softcover, 36 pp., \$6.95



Kites: The Science and the Wonder by Toshio Ito and Hirotugu Komura. Full of aerodynamics, formulas and observations—the first effort since Marvin to be scientific about kites. Diagrams for the "original" butterfly kite. First published in Japanese (1979), the English translation (1983) is not smooth. Softcover, 160 pp., \$11.95



Kites: An Historical Survey by Clive Hart. Revised, second edition (1982). Invaluable reference work with many black-and-white illustrations and photos. Fascinating, readable in-depth research in early kiting. The most extensive kite bibliography in print. No plans. Hardcover, 210 pp., \$31.95 Softcover, 210 pp., \$14.95



Chinese Kites by David Jue. A little classic: brief history and legends from China preserved by a deceased Chinese American. Tips, tools, designs, techniques and construction details for 10 relatively simple Chinese kites using rice paper and bamboo. Colorful paintings. Hardcover, 56 pp., \$11.95



25 Kites that Fly by Leslie Hunt. Reprint of 1929 original. Contains good old plans for kites not seen much anymore (shield, yacht, elephant, etc.) using orange crate sticks and flour-and-water paste. Also historical data, photos and details. Hunt was a kitemaker for the U.S. Weather Bureau. Softcover, 110 pp., \$2.95



Make Your Own Kite (new kites) by John W. Jordan (deceased). Plans for nine kites from unusual but easy-to-get materials such as plastic foam and computer cards. Clear instructions, amusing reading from a genuine enthusiast ("You will never find an unhappy person at the end of a kite string.") Quantity limited. Softcover, 90 pp., \$6.95



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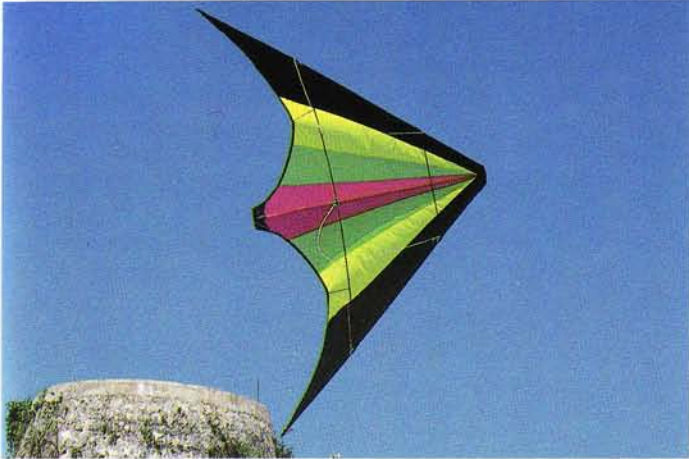
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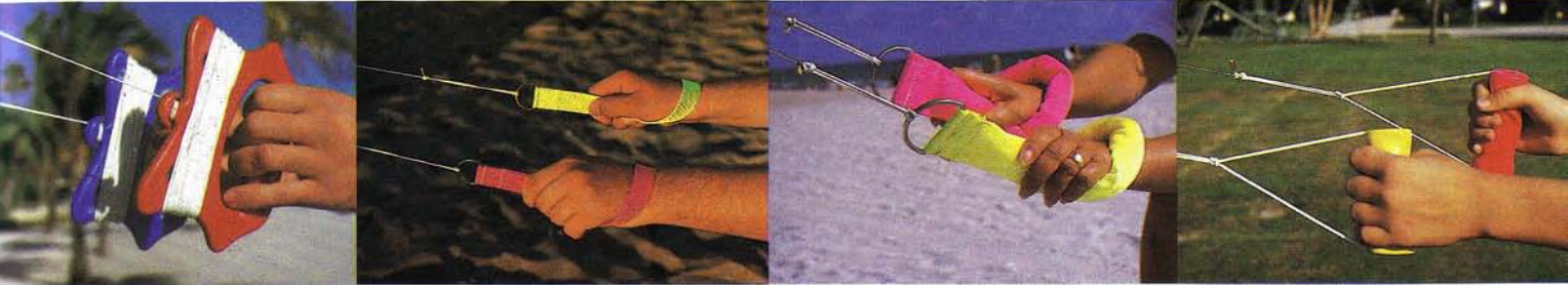


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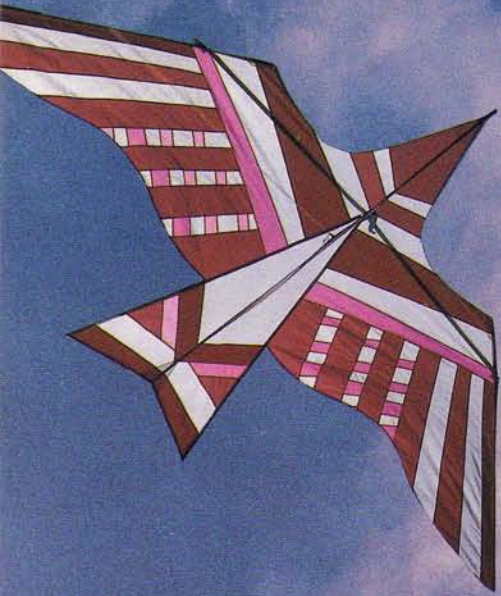
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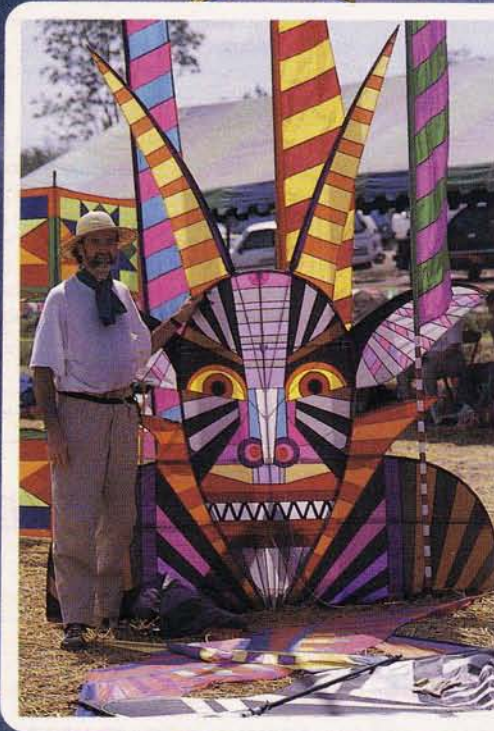
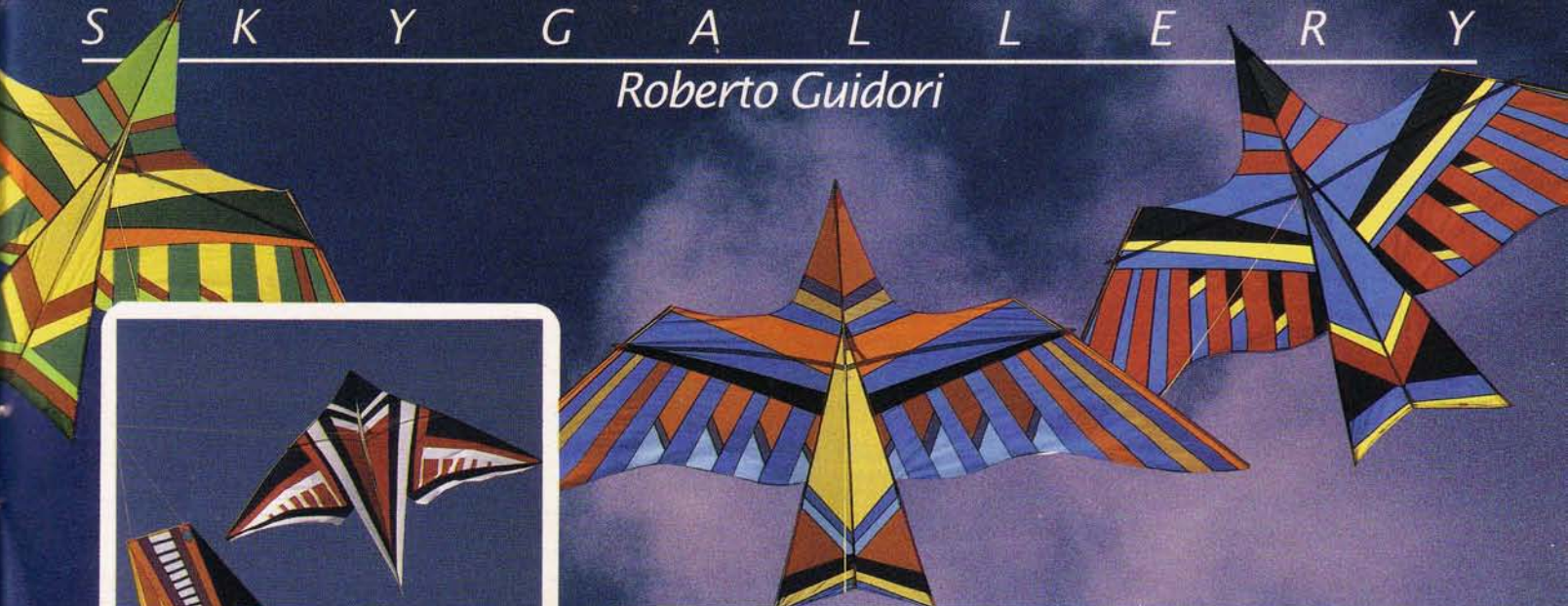


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Kitemaker: George Peters, age 43, artist and sculptor, Boulder, Colorado, USA.

Kite experience: 15 years.

Inspiration: Tal Streeter's *Art of the Japanese Kite* and looking at dragonflies.

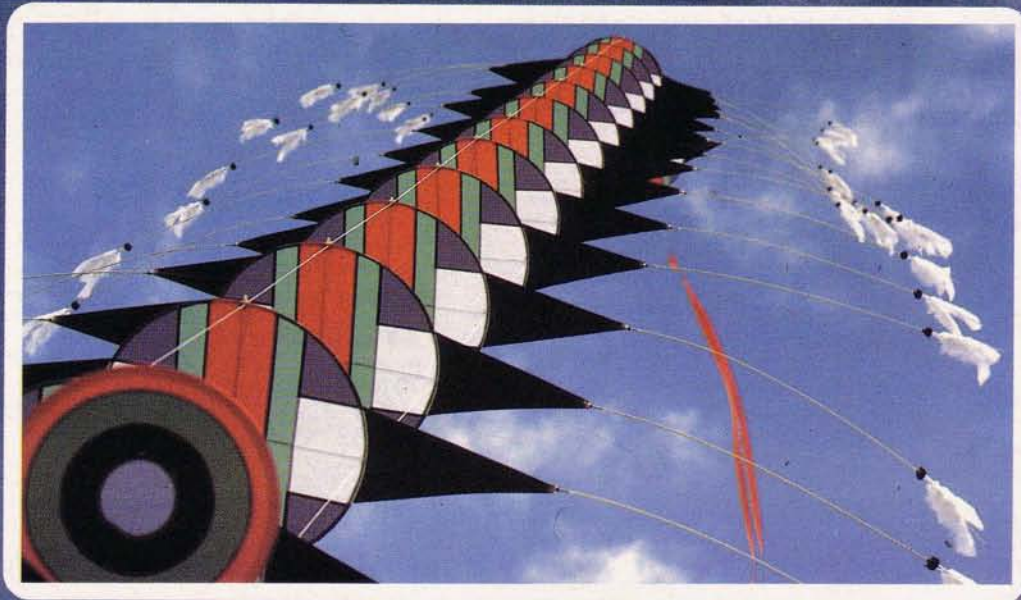
Average number of hours spent making a kite: If I say four, it's probably closer to 40.

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Photographs: George Peters



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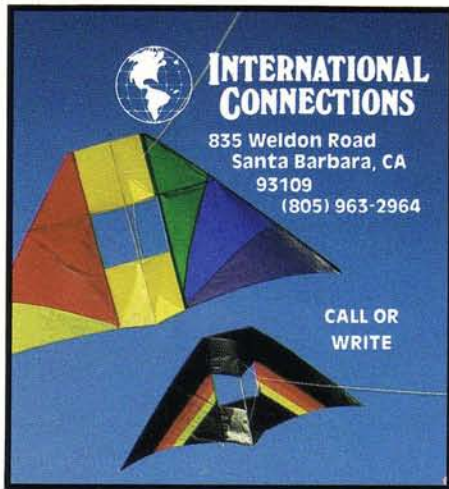
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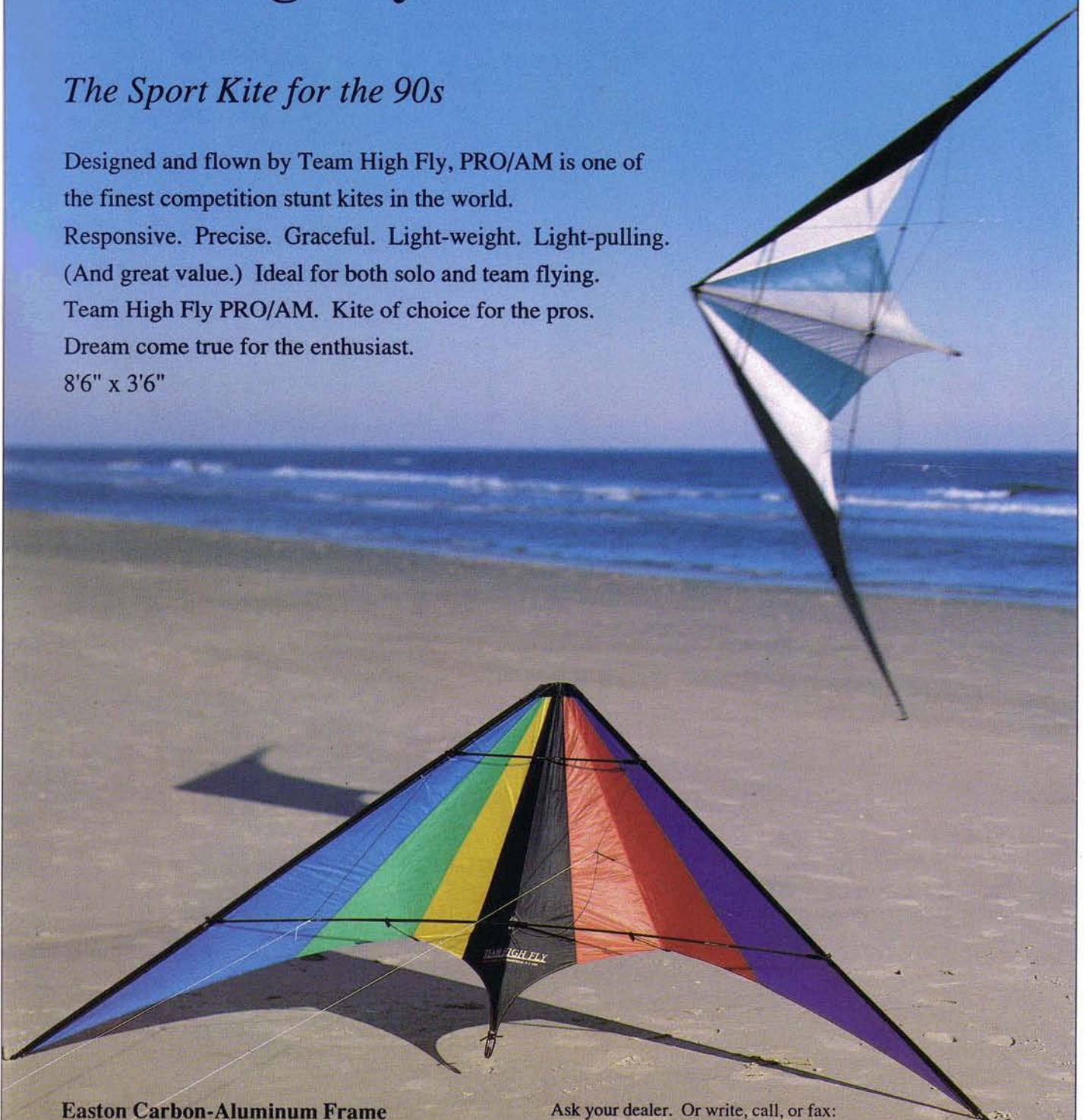
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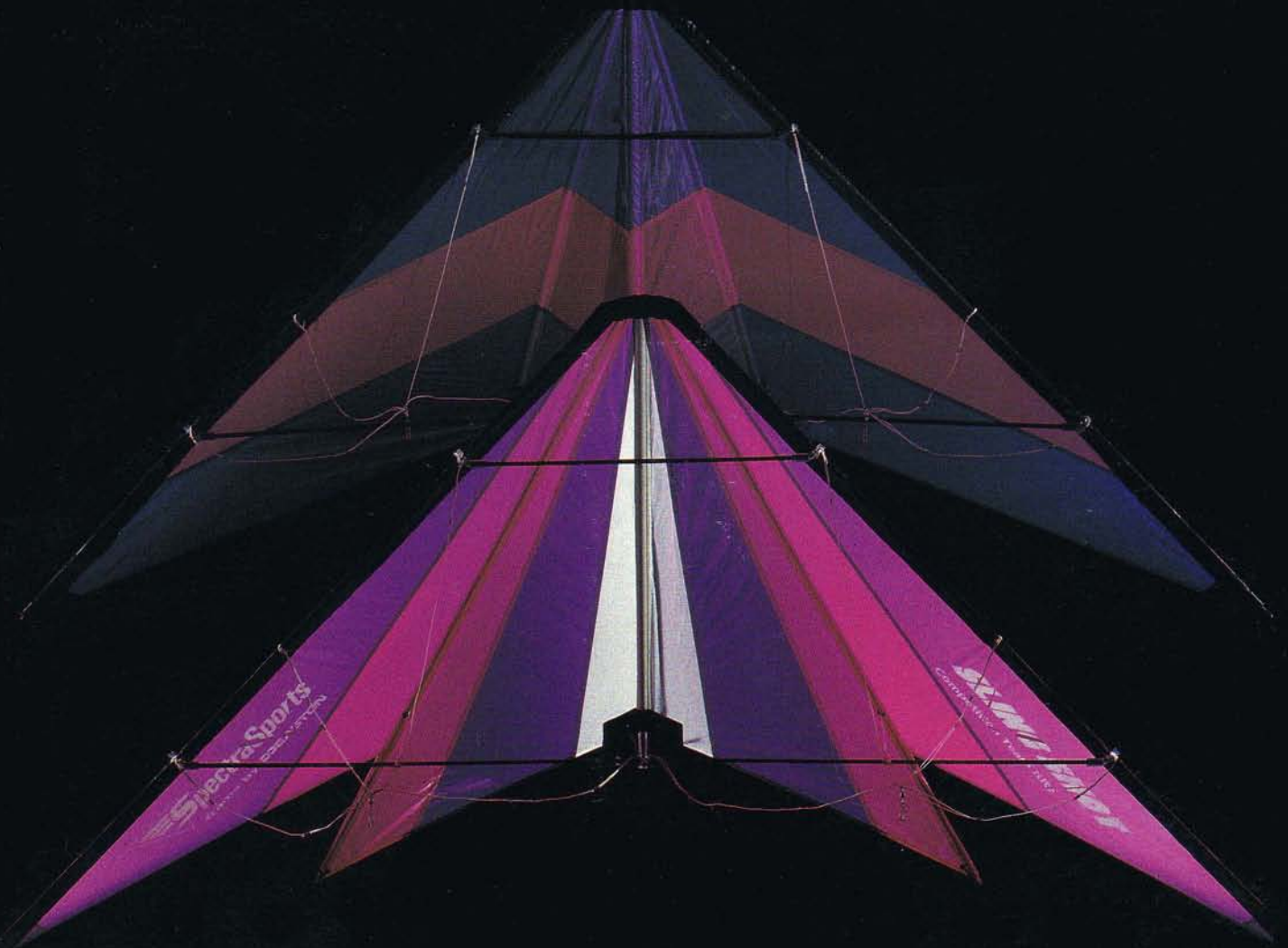
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