PINEY MOUNTAIN AIR FORCE

Box 7304 * Charlottesville * Virginia * 22906-7304

DATA☆LETTER

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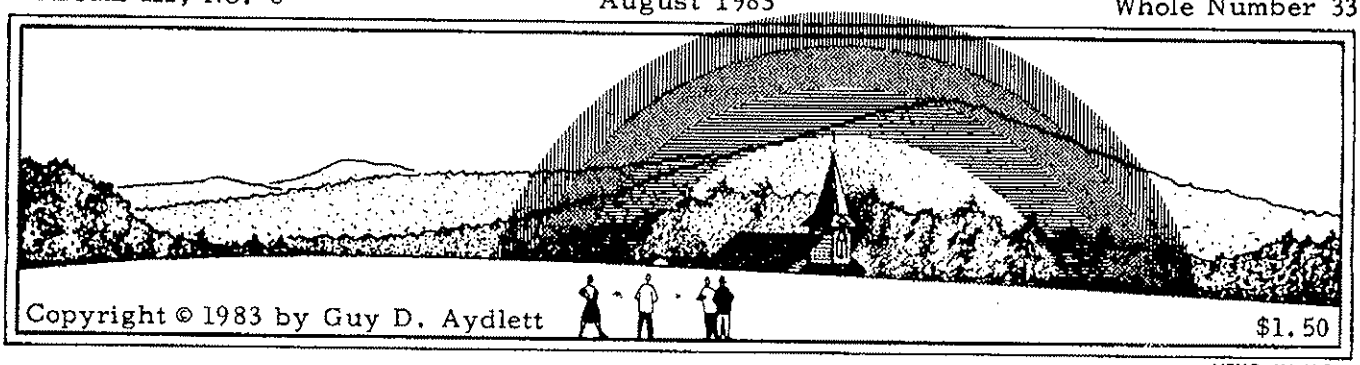


LITHO IN U.S.A.

AUGUST, The Eighth Month, promises 31 hot days for PMAF fliers. Light and variable airs are likely to ground all but the lightly loaded kites, but those days will be just fine for imprudent fliers who go aloft in ultralight airplanes or hot air balloons. (Last year, the Hornbeam Clan checked out the *Weedhopper C* ultralight. This year, on the 1st of July, we resumed flight practice in the *Quicksilver MX* at T.I. Martin Airport in Culpeper, Virginia. We also hope to test-fly thoroughly the *American Aerolights Double Eagle* by October.)

More about August: On the 3rd, in 1492, guess who left Spain and crossed the Atlantic in his quest for a western route to the Orient? Dog Days end on the 11th. Cat Nights begin on the 17th, and tomatoes commence to ripen in Harry Yeoman's Kodak City.

Full moon on the 23rd.

On the 30th, in 1862, General Lee's Confederate Army routed Union Army troops in the 2nd Battle of Bull Run (no truth to any rumor that Rebel Headquarters were situated at 10,000 Lomond Drive, Manassas, Virginia).

*

DEADLINE for handing camera-ready *DL* text and artwork to our printer is the 15th of the month preceding that of the issue. Thus, the printer gets a turn-around time of 10 to 15 days to print a good job and still permit us to get your copy into the mails before the 1st of the edition month. Sam, the printer, had mechanical troubles with our July edition and ran extras that had to be culled for tolerable quality. For punctuality's sake we mailed the best copies available. Was yours a good one?

TONY OTIS of Bar Harbor, Maine told us how he lost a J-15 Parafoil and an American flag along the coast of Rye, New Hampshire and eventually recovered them: ". . .My parafoil was lifting a 5' x 8' nylon U.S. flag and was doing well up to the instant the kiteline separated because of the cutting frictional heat of a Gayla kite that spun three loops of its own line around the parafoil line. In the high wind, both kite and flag drifted far inland; eventually lodged 60' above ground in some large trees.

"The contrite Gayla flier offered to pay for a new kite and flag rather than have me risk getting killed in a recovery attempt. We managed to work the parafoil down without peril, but the flag was too far up on small branches to safely attempt retrieval."

Tony was given $20 for his lost flag; but tree-worker Dennis Purdie and his nephew, Randy Prescott, recovered the flag and gave it back to Tony:

". . .For their bravery, insanity, agility, and professionalism, I transferred the $20 to Dennis and Randy. The flag will fly again."

*

BILL TYRRELL, The Fabric Lady, makes and sells a fancy dangler that may be flaunted by fliers who don't own flags to fly. The PMAF sample is a 12" dia. polychrome ripstop fabrication that Bill calls *The Windspinner*, but he says: ". . .Fran Gramkowski told my wife, Mary, that The Windspinner was an Irish—****** (she's Irish). She replied that it really was a Polish [special kind of beanie] (he's Polish)." *[Anyway, it spins; spins. —Nisse]*

(more on page 4)

HOLLOW SECTION SHAPES: THEIR EFFECTS ON THE STRENGTHS OF KITE FRAME MEMBERS

by Ben D. Beems

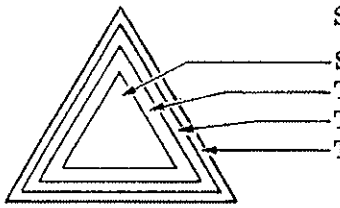
EVERY KITEFLIER knows that a tubular spar, longeron, or spreader is likely to be a better load-bearing member than one that has a solid section, the same sectional area, and is made of identical material in the same length.

Kitefliers who read page 2 of *DL #32* were reminded that structural members made with equal lengths, solid sections of equal areas, and of identical materials differed in their abilities to sustain loads because of the differences in the geometrical shapes of those sections. The regular polygon sections were featured because each section has the property of offering the same resistance to any load, regardless of its direction, that is applied through—and perpendicular to—the neutral axis of a member (the neutral axis is assumed to be perpendicular to a right section and to pass through the geometrical center of that section).

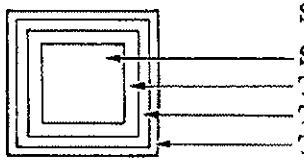
Remember that the polygon with the least sides—the equilateral triangle—had the highest moment of inertia and therefore had the greatest stiffness, or resistance to a load? The polygon with the most sides—an infinite number in a circle—had the least resistance.

The triangle, the square, and the circle are analyzed here as tubular structure sections because of the high strength of the triangle and the availability or the ease of fabricating square or circular shapes; but before we utterly abandon the solids, heed this summary: If a solid-section member of a given length is replaced by a member of the same length and material, but with a larger but similar section, its section area—or weight—will increase as the square of a linear dimension. The bending resistance will increase as the square of the area of the newer section.

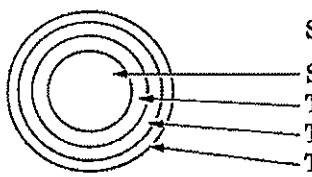
Members with tubular cross sections offer superior strength and economy of material: If a solid-section member of a given length is replaced by a member of the same length and material, but with a tube section having an area equal to that of the solid, their weights will be identical; and if the tube bore dimensions match the perimeter of the solid, the tubular member will have a bending resistance *three times greater* than that of the solid member. If the solid section stiffness is assumed to be 1.0, a succession of telescoping tubes, each equal in area to the original solid, will follow this stiffness series: 3.0, 5.0, 7.0, 9.0, 11.0 . . .and so on. As bore dimensions increase, wall thicknesses have to diminish to keep areas—and weights—constant. A point will be reached at which a too-thin wall will fail by buckling under a triflingly small load.



SECTION	AREA (cm^2)	SIDE	THICKNESS	I_g (cm^4)	STRENGTH*
Solid	1.0	1.5197	-------	0.0962	1.1547
Tube #1	1.0	2.1491	0.1817	0.2887	3.4641
Tube #2	1.0	2.6321	0.1394	0.4811	5.7735
Tube #3	1.0	3.0393	0.1175	0.6736	8.0829



SECTION	AREA (cm^2)	SIDE	THICKNESS	I_g (cm^4)	STRENGTH*
Solid	1.0	1.0000	------	0.0833	1.0000
Tube #1	1.0	1.4142	0.2071	0.2500	3.0000
Tube #2	1.0	1.7321	0.1589	0.4167	5.0000
Tube #3	1.0	2.0000	0.1340	0.5833	7.0000

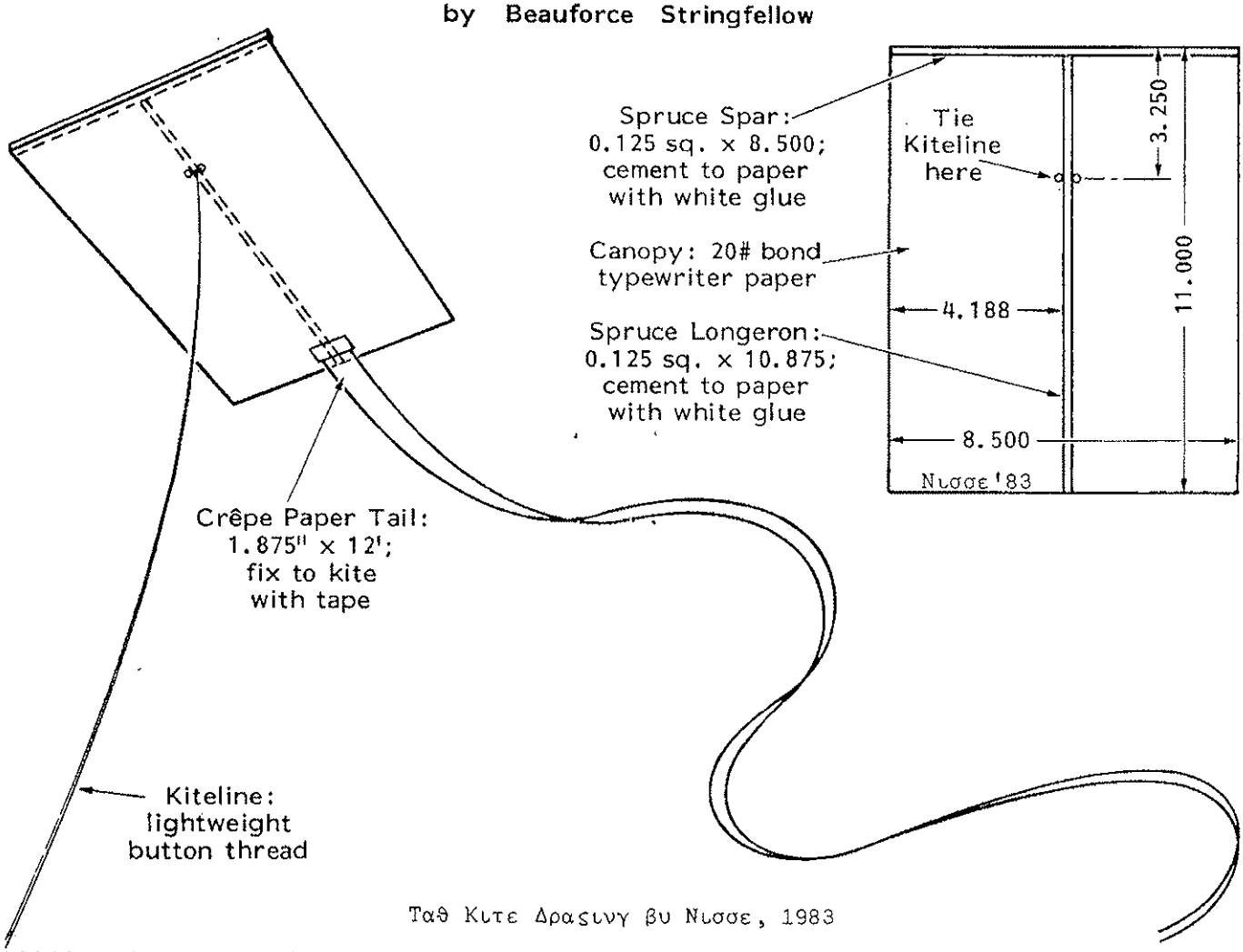


SECTION	AREA (cm^2)	DIA.	THICKNESS	I_g (cm^4)	STRENGTH*
Solid	1.0	1.1284	-------	0.0796	0.9549
Tube #1	1.0	1.5958	0.2337	0.2387	2.8648
Tube #2	1.0	1.9544	0.1793	0.3979	4.7746
Tube #3	1.0	2.2568	0.1512	0.5570	6.6845

*Strength values are relative and referenced to a 1.0 cm square section whose stiffness, or resistance to bending (when incorporated into a structural member), is normalized to unity. These tabular values are based on the assumption that all of the analyzed sections are used with structural members that have identical loadings, lengths, section areas, and materials.

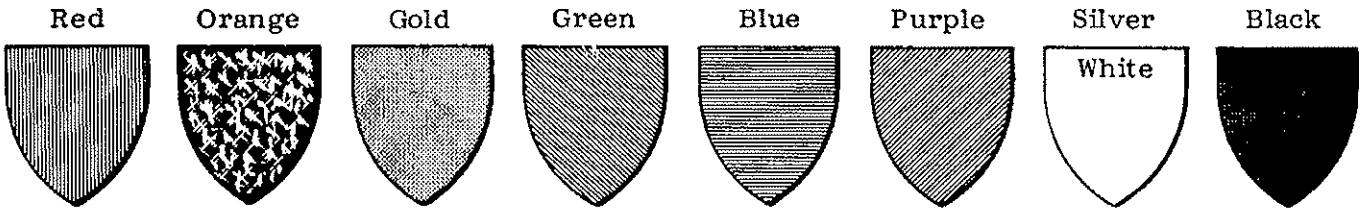
A TAU KITE FOR CHILDREN: QUICKLY MADE; EASILY FLOWN

by Beauforce Stringfellow



LINE SYMBOLS FOR COLORS IN HERALDIC PRINTING AND ENGRAVING

by S. Cutcheon



COLOR PRINTING had not been perfected in the olden days when the sages, the heralds, and the scribes commenced to record the details of design and color in armorial bearings and flags. Documents, pictures, scrolls, and even books had to be hand-colored until line symbols acceptable to all were adopted.

All of the drawings above, except for the representation of orange, are standard color symbols for the U.S. Patent Office, heralds, and vexillologists. Orange is a special symbol devised for use in Patent Office documents.

The colors used in heraldry bear lovely old names such as: *gules*—red, *sanguine*—dark red, *or*—gold or yellow, *vert*—green, *azure*—blue, *purpure*—purple, *tenny*—tawny (we don't know a symbol for *tenny*), *argent*—silver, and *sable*—black. Display your colors!

T. L. CONOVAIR, curry-spondent from New Jersey, admonishes us: ". . .Speaking of typos: your reply to Phoebe B. Boebe and your offer of an inflated issue of *Data Letter* if she locates 'the seven other' grammatical errors is laughable. Just to be a smart ass, I thought I would try to find a few. . .and gave up after I used all my fingers and toes. Shoot, I found a fistful in one issue alone. Of course, if you are speaking of strictly GRAMMATICAL errors, not the occasional omitted comma, then the number would decline a wee bit. However, I'd like to know one thing: which form of the verb 'to fly' do you endorse —'flys' or 'flies'—since you seem to use both with abandon?"

Lordy, Phoebe B. Boebe really has tipped over a vast bucket of snakes; but a good letter deserves an answer: Phoebe was asked to seek seven grammatical errors in DL 32 only (we didn't want to give her writers cramp).

She was not invited to monitor punctuation such as those little dots that close sentences and all of the other nasty little symbols that we lay on the paper with a condiment shaker.

D L subscribers have not yet sorted out "flys" and "flies," so we straddle the issue and use both. Their indiscrete use prompts the erudite to send letters that are printable and interesting. PMAF authors are always delighted to receive constructive criticism, and some are even willing to become housebroken. If English majors would correct our stuff, we should be delighted to replace marked copies of DL with fresh ones. So there! —Non-ed.

*

REDEYE WHEELER, Southbury, CT, inquires: ". . .Can an ultralight carry a Kurzweil machine?" *[At $1 per pound for the $29,800 device for the blind, we'd hazard "no!" —Nisse]*

GAR DE LOU of Scrabble, VA fires this shot: ". . .Vexillologist James J. Kilpatrick and the other heraldic flag mavens of Scrabble won't be pleased with your rendering of the French Tricolor on the masthead of *DL #32*. Starting from the hoist, the first color should be blue, white next; red last. Yer danged color code's reversed. *[Yer danged right; see p. 3. —Nisse]*

*

ALAN A. WHEELER, Fairfax, VA, likes *DL*: "I was out of the country during the period that my subscription ran out. . . .

"Would you please be so kind as to resume my subscription with the June, 1983 issue? This will continue my complete file of your excellent publication.

". . .You do good work with your newsletter, and all of us out here appreciate it."

*

CHARLIE SOTICH, a kite champion who lives in Chicago, has reached way back in *DL* lore (*DL #4*, March 1981) and has expressed his belief that the rule-of-thumb equation for the minimum wind velocity to sustain a kite should be changed from $V = 5(W/A)^{\frac{1}{2}}$ to: $V = 7(W/A)^{\frac{1}{2}}$. A hypothetical *lift coefficient* of 0.977 was our basis for deriving the first equation; Charlie likes 0.499. Does anyone prefer $V = 6(W/A)^{\frac{1}{2}}$?

*

SPECIAL GRATITUDE goes from Piney Mountain to these generous folk: Gerry Osborne, Thorpe, WA, for cheerful illuminations on his envelope and in his letter; Jim Carnwath, of Kirkland, WA, for lending us precious documents from his kite files; Felix Cartagena, of Newark, Delaware (*Windy Notice* editor), for the nylon Delaware flag for PMAF flagpoles; Chester W. Howard, Director of the Japanese Clock Museum, Kamakura, for the picture of a 57-year-old Swallow biplane. *[More in Sept.]*

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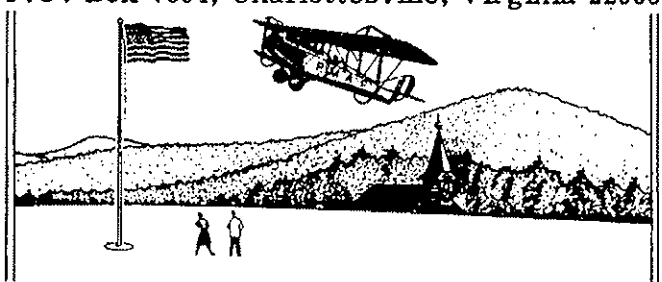

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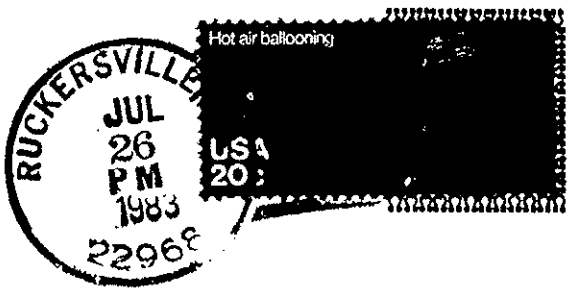

Feb 1983
(S 332)

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