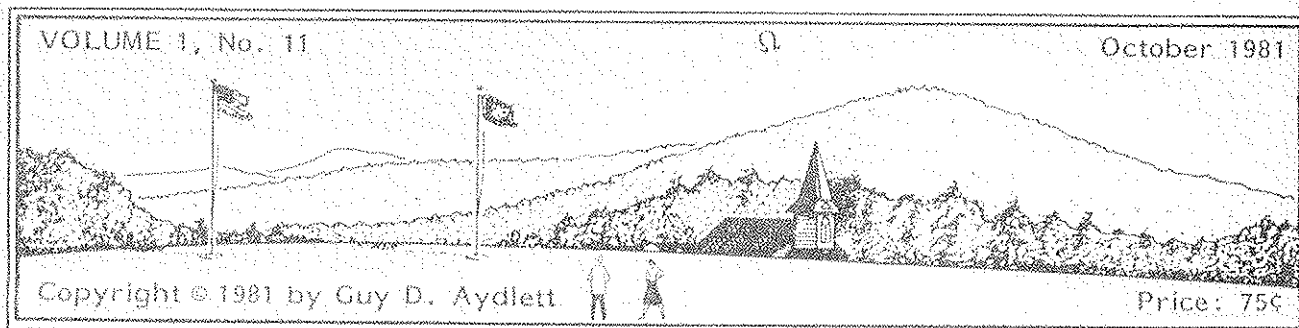


PINEY MOUNTAIN AIR FORCE

DATA - LETTER



Dear Kiteflier:

GOOD KITE-LETTER NEIGHBORS, during past months, have obliged PMAF by publishing a near half-century-old photograph [next column] and some accompanying captions that comprised an antiques-identity contest. The cooperative effort revived a rash of kiteflier interest in old airplanes, in old engines, and in old kiteflier-pilots.

Some Old Birds have survived man-killer flat-spinners, economic depressions, wars, marriages, and time-aggravated debilities. Some have vicariously bolstered their memories of the air-realm and have discovered a new sky-consciousness undreamed of until they seriously resumed kitemaking and kiteflying.

If, at your next kite festival, you find a salty-tongued auld curmudgeon applying blue tints to the ambience, don't be foolish enough to ask him which grandkid's kite he is flying; you might be surprised to see the atmosphere rapidly change from azure-hue to saturated indigo. (Instead, you might rashly ask him if he taught Wilville and Orbur to fly. . . .) Photo: Va. Tech BUGLE →



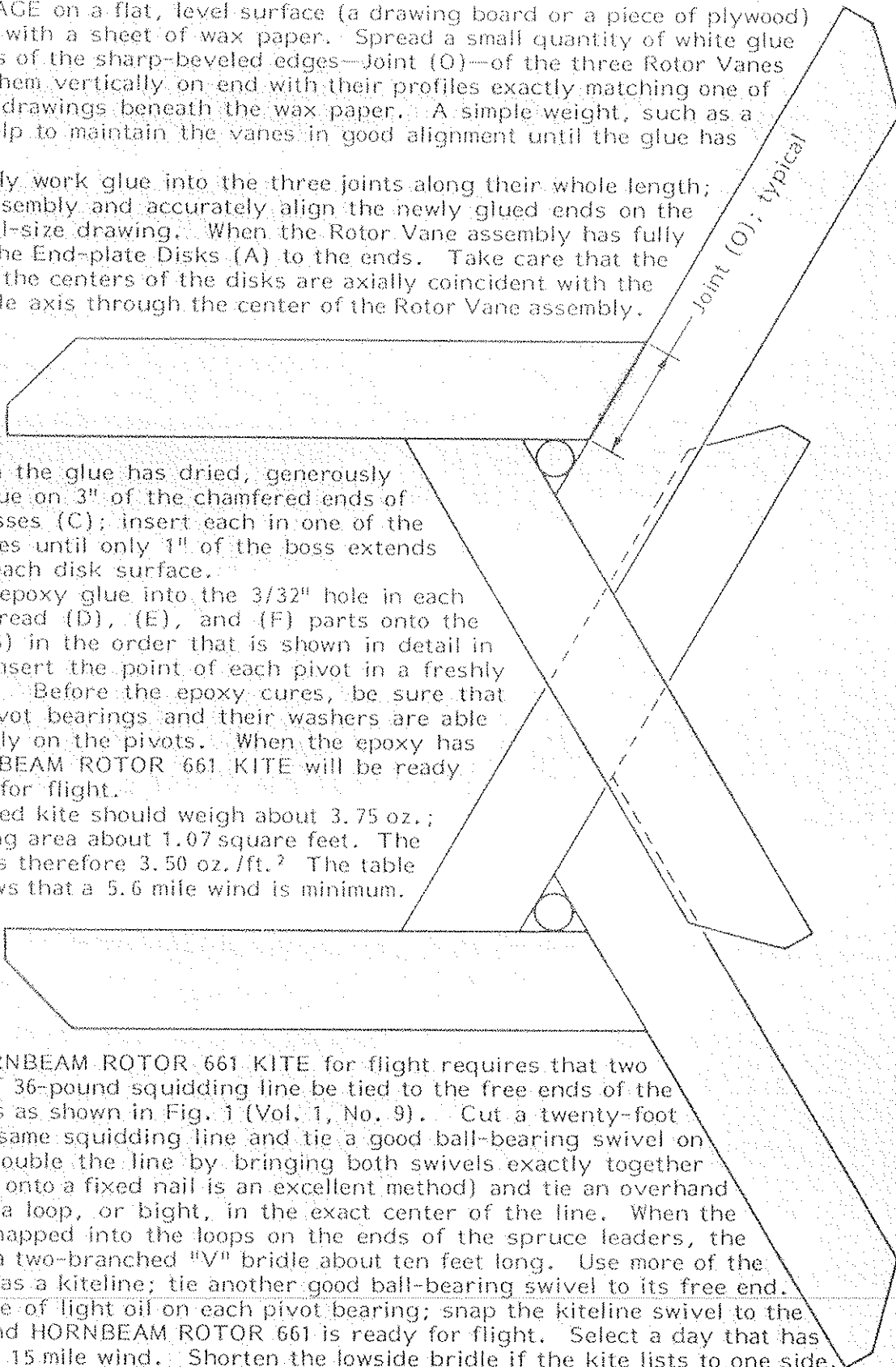
THE ANTIQUES IDENTITY CONTEST was this: Subscribers to AKA NEWS, KITE FLYER, TIGHT LINES, WKA NEWS, and 5/20 KITEGROUP NEWS were invited to try to identify the airplane, the engine, and the pilot as thoroughly as possible—deadline: 1 September 1981. Each winner was to receive a one-year subscription to his club magazine plus a one-year subscription to Piney Mountain Air Force DATA-LETTER. As this is being written, the winners are known to us; but in fairness to our brother kite-letters, their good editors shall have the privilege and pleasure of first publishing the names of their clubs' winners.

THE RESPONSES to the contest were numerous; qualities of the responses ranged from abysmal levities to erudite esoterica. Some examples: Tripe-plane (one tripe missing), 1A Sopwith Hornbum, Waco F5, Kinner Bird, Rickenbacher, Lindbergh, and—Snoopy. . . .

ASSEMBLY of HORNBEAM ROTOR 661 KITE

LAY THIS PAGE on a flat, level surface (a drawing board or a piece of plywood) and cover it with a sheet of wax paper. Spread a small quantity of white glue near the ends of the sharp-beveled edges—Joint (O)—of the three Rotor Vanes (B); stand them vertically on end with their profiles exactly matching one of the full-size drawings beneath the wax paper. A simple weight, such as a book, will help to maintain the vanes in good alignment until the glue has dried.

Next, gently work glue into the three joints along their whole length; invert the assembly and accurately align the newly glued ends on the remaining full-size drawing. When the Rotor Vane assembly has fully dried, glue the End-plate Disks (A) to the ends. Take care that the 1/4" holes in the centers of the disks are axially coincident with the triangular hole axis through the center of the Rotor Vane assembly.



Again when the glue has dried, generously coat fresh glue on 3" of the chamfered ends of the Pivot Bosses (C); insert each in one of the 1/4" disk-holes until only 1" of the boss extends outboard of each disk surface.

Work some epoxy glue into the 3/32" hole in each boss-end; thread (D), (E), and (F) parts onto the two Pivots (C) in the order that is shown in detail in Figure 6. Insert the point of each pivot in a freshly epoxied hole. Before the epoxy cures, be sure that the leader/pivot bearings and their washers are able to rotate freely on the pivots. When the epoxy has cured, HORNBEAM ROTOR 661 KITE will be ready to be rigged for flight.

The completed kite should weigh about 3.75 oz.; effective lifting area about 1.07 square feet. The area loading is therefore 3.50 oz./ft.² The table on page 4 shows that a 5.6 mile wind is minimum.

RIGGING HORNBEAM ROTOR 661 KITE for flight requires that two equal loops of 36-pound squidding line be tied to the free ends of the spruce leaders as shown in Fig. 1 (Vol. 1, No. 9). Cut a twenty-foot length of the same squidding line and tie a good ball-bearing swivel on each end. Double the line by bringing both swivels exactly together (hooking them onto a fixed nail is an excellent method) and tie an overhand knot to make a loop, or bight, in the exact center of the line. When the swivels are snapped into the loops on the ends of the spruce leaders, the line becomes a two-branched "V" bridle about ten feet long. Use more of the same 36# line as a kiteline; tie another good ball-bearing swivel to its free end.

Place a trace of light oil on each pivot bearing; snap the kiteline swivel to the bridle loop; and HORNBEAM ROTOR 661 is ready for flight. Select a day that has a steady 10 to 15 mile wind. Shorten the lowside bridle if the kite lists to one side.



THE HORNBEAM WIND VELOCITY EQUATION FOR KITES

MOST KITES function in an aerial environment that is close to what aerodynamics scholars call *standard density*; that is, the Standard Air Density = $\rho = 0.002378$ slug per cubic foot at 15° Celsius. With that premise assumed, we can use the standard textbook formulae, choose units more familiar to the everyday kiteflier, and state:

$$L = 0.0409 C_l S V^2 \quad (1)$$

where

L = Lift in ounces

C_l = A lift coefficient that depends on the aerodynamic qualities of a kite

S = Area of the kite in square feet

V = Wind velocity in miles per hour

We can re-arrange equation (1) and use it to predict the minimum wind velocity that is necessary to barely sustain the weight of the kite (line angle = 0°):

$$V = 4.943 \times (L/C_l S)^{\frac{1}{2}} \quad (2)$$

$$\text{or} \quad V = 4.943 \times (W/C_l S)^{\frac{1}{2}} \quad (3)$$

where L = W = Weight of the kite in ounces

If, for an ordinary kite, we select a lift coefficient of 0.977 (reasonable for a kite that is attempting to rise at a high angle of attack), equation (3) becomes:

$$V = 5 (W/S)^{\frac{1}{2}} \quad (4)$$

It has been determined—both theoretically and empirically—that the maximum lift coefficient for a *driven* cylindrical rotor-kite is $4 \times \pi$, or 12.566. But our 3-lobed rotor kite is not a cylinder, nor is it power driven. Therefore, a modest lift coefficient of about 2.715 is more appropriate, and we get this equation:

$$V = 3 (W/S)^{\frac{1}{2}} \quad (5)$$

From equation (5) we can make a table of Weight/Area versus Wind Velocity that will be good for HORNBEAM ROTOR 661 KITES made in most practical sizes and weights:

WEIGHT/AREA vs WIND VELOCITY TABLE for HORNBEAM ROTOR 661 KITE

(Weigh your kite in ounces and divide that weight by the projected area of the kite in square feet. Find that quotient in a "W/S" column. The "V" value that is paired with the quotient is the minimum wind velocity—in miles per hour—that will sustain your kite.)

W/S	V	W/S	V	W/S	V	W/S	V	W/S	V
1.0	3.00	2.0	4.24	4.0	6.00	9.0	9.00	17.0	12.37
1.1	3.15	2.2	4.45	4.5	6.36	9.5	9.25	18.0	12.73
1.2	3.29	2.4	4.65	5.0	6.71	10.0	9.49	19.0	13.08
1.3	3.42	2.6	4.84	5.5	7.04	10.5	9.72	20.0	13.42
1.4	3.55	2.8	5.02	6.0	7.35	11.0	9.95	21.0	13.75
1.5	3.67	3.0	5.20	6.5	7.65	12.0	10.39	22.0	14.07
1.6	3.79	3.2	5.37	7.0	7.94	13.0	10.82	23.0	14.39
1.7	3.91	3.4	5.53	7.5	8.22	14.0	11.22	24.0	14.70
1.8	4.02	3.6	5.69	8.0	8.49	15.0	11.62	25.0	15.00
1.9	4.14	3.8	5.85	8.5	8.75	16.0	12.00	26.0	15.30

*

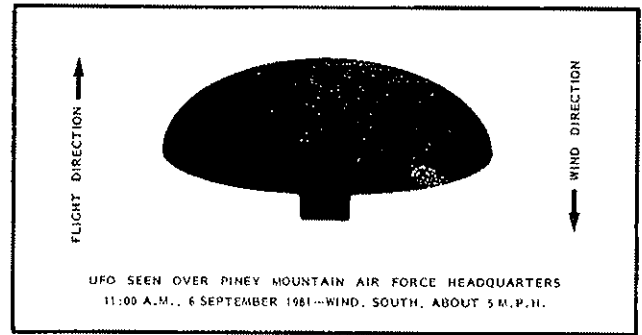
FAMOUS INTERNATIONAL KITE DESIGNERS endorse Piney Mountain Air Force's distinctive *DATA-LETTER* and share their plans and thoughts with its readers. For one whole year (12 monthly issues) of *DATA-LETTER*, send check or money order (no cash) to: Guy D. Aydlett, c/o Piney Mountain Air Force, Box 7304, Charlottesville, VA 22906. (In the U.S.A. and Canada: \$7.50 per year by first class mail; overseas: \$12.50 by airmail.)

ANOTHER UFO

PMAF HAS ITS OWN UFO. Really. . . !

Because of inclement weather during the night before, we did not raise our flags at our usual time on the morning of the 6th of September; but by late morning the solidly overcast sky became bright—white—and a warm, gentle breeze promised a fine ending for the day. Just as we had secured the colors of The Commonwealth of Virginia on the visitors' mast, the black silhouette of a south-moving flying object grabbed our attention: A hawk? No, the shape was not right for a hawk. A vulture? Not so (all Central Virginians know well the shapes of our ubiquitous turkey vultures and the less frequently seen black vultures). An artifact? Hm-m, maybe, but not a break-away kite; free kites don't work to windward on straight, nearly bobble-free courses. . . .

To the best of our judgement, the black object appeared to be about one metre in span; at about 150 metres in altitude. It was seen to yaw twice—slightly and quick-



ly—during the 30 or 40 seconds that it was in sight (an indication, we think, that it was a small object with low mass). As the UFO faded from sight towards Charlottesville-Albemarle Airport, it was evident that in elevation it was of a uniform, plane-like thinness (no body-bulge as a bird or bat would display in elevation).

Independent measurements of a series of memory sketches gave us the proportions that are given in the accompanying drawing. Has anybody else seen such a thing?

Δ
DR. P.J. MODJESKI, Richmond, VA saw his first copy of *DATA-LETTER* when he attended PAT HAMMOND'S great kite show at The Science Museum of Virginia. He had never flown a kite before: "I received a free copy of *DATA-LETTER* #4 at our Science Museum in Richmond. I built the 'Sanjo Rokkaku' using a trash bag and a few sticks. It flew beautifully—my very first flight. Since subscribing to *DATA-LETTER*, I have built several Hornbeams, 3.5 to 8.9 sq. ft., and the Nelson-Allison sled. I must say their performance is exhilarating." [All kites mentioned were made from plans published in *DL*.]

Although recently retired, Phil Modjeski is keeping busy. Among other efforts, he is aggressively experimenting with methods for coloring Tyvek®. His samples look good!

Δ
METRICATION has arrived at Piney Mountain. Recently, a visiting authority gave us an unassailable conversion constant: ". . . Uh litter is about two shots more'n uh quart." (He's no relation of our Oriole Surgeon who fixes Hyannis Hernias and Migrant Headaches.)

Δ
MARGARET GREGER and STORMY WEATHERS have presented PMAF HQ with ingenious, stickless, ALLIFLEX kites (they used to be misnamed "sleds"). Both were made of thin paper: Margaret's from a department store shopping bag; Stormy's from a newspaper's colorful cartoon page. Margaret stapled four-thickness pleats in the Hornbeam Mark I that she made; Stormy used two-thickness pleats fortified by two-sided and one-sided sticky tape in the "Horned Allison" of his own design. More will be told about them later.

Δ
DATA-LETTER NUMBER 12: This is it! You charter subscribers—bless ye!—have now received a whole year's worth of PMAF's yellow journalism. As a sneaky way of enticing you to re-subscribe, we want you to know that great things are planned for the December issue which will include a detailed, two-page index insert for the entire Volume 1. Don't miss out on the good things that are planned; don't forget that your continued patronage provides vital balm for PMAF's fiscal bruises. A handy subscription form is included in this issue of *DATA-LETTER*. Please use it if your mailing label shows "NOV" in the upper righthand corner. U.S. subscribers who renew before 1 January 1982 can still receive a one-year subscription for \$7.50, even though a second round of postage increases is imminent. (Commencing immediately, all overseas subscriptions will be \$10.00 a year by surface mail; \$12.50 by airmail.) Remember: extend your subscription before 1982; save!

Page 4, PMAF *DATA-LETTER*—November 1981