

NAT PUFFER, MESA AZ--"Lower Winglets Important!"

I was quite surprised to learn how important lower winglets are, and what a big difference just a small change in canard span can make. IVCHC members might be interested in the aft c.g. testing we did on the Cozy Mark IV, where we evaluated the effect of both lower winglets and canard span on stall characteristics.

To summarize the results of our aft c.g. testing:

1. With the original canard span and no lower winglets, the main wing stalled and the airplane rolled off on one wing at a c.g. of 101.05
2. Same as above but with wing cuffs, the stall and roll off occurred at a c.g. of 100
3. With original canard span and lower winglets, a wings-level main wing stall occurred at c.g. 101.6
4. With canard span reduced 4" and lower winglets, the canard would stall but not the main wing from a c.g. of 101.5 back to and including a c.g. of 103.2
5. With canard span reduced 6" and lower winglets, same as above with added safety margin.
6. Builders will be directed to shorten their canard span by 6" and install the lower winglets shown in the plans to have a usable c.g. range of 97.5 to 102.1, and a point of neutral stability of 105.4.

In conclusion, we did not think that adding just a few inches to the canard span (as compared to our prototype) would make a measurable difference. We also omitted the lower winglets when we built our plans model Mark IV because we had been told by people whose opinion we respect that the lower winglets did not perform any useful aerodynamic function. What we encountered came as a complete surprise. We never would have dreamed these two small changes would have such a profound effect.

(Ed: Nat and Tom McNeilly built a mechanism to install in the Mark IV. It allowed them to move the c.g. approx. 4 inches aft of the aft limit Nat had designed the plane for. This was done so that if a stall occurred, they could move the c.g. back again to the forward limit.)

Jim Patton, an experience test pilot, did the aft c.g. testing, wearing a parachute, on loan from Harry Bawcom. It was a good thing that Nat got an experienced pilot to do the flight testing. Jim ended up showing to the world that you can fly the Mark IV with the canopy fully open. This was not part of the testing program; it just happened. Jim kept his cool, doing the only thing that was important--flying the airplane.

THANK YOU, NAT! Your efforts and dedication to help make homebuilt aircraft safer to fly is deeply appreciated!)

** CENTRAL STATES ASSOCIATION 1994 EVENTS **

* April 12, 13, 14--Bahamas Fly-In *

Location: Great Harbor Cay in the Berry Islands, 120 miles East of Miami

Send your check (\$100.00) to Tropical Diversions, Great Harbor Cay, 3512 N. Ocean Drive, Hollywood, FL 33019 (contact Anna at 1-800-343-7256). Write "EZE fly-in" on your check.

For more information, please contact Steve Wright, the Coordinator, at 615-373-9707, or Vance Atkinson, the Flight Leader, at 817-354-8064.

* June 17, 18, 19--Kansas City GIG "Grazin in the Grass" National Canard Fly-In *

Location: Johnson County Industrial Airport

Send a registration fee of \$10.00 per person to cover the airport facility cost (payable to Terry Yake) to 8904 West 116th Terrace, Overland Park, KS 66210-1963. (If you need to cancel, do so by June 10 to get a refund.)

*** THE NORTHEAST EZ FLYERS ***

(Condensed from Bill Dillinger's NEF Newsletter)

9/12/93: Paul & Barbara Adrien, Blain & Laurleen Boyd, Bob LaBonte, Bill Dillinger & Linda, and Darryl & Nancy Wright--a flight of five--departed for another "Statue of Liberty" run.

With "Met Life" blimp also on a river run, the group shot a bunch of film. With 4 EZs following the Wrights' BD-4, everyone circled the "Lady" twice, paying her proper respect. (Ed: We would love to see a video tape of this flight!)

The group flew along the shore and landed at Bridgeport, CT., for great pizza at Rose's. When the group got back to the airport, they found a Lancair, a Sidewinder, and a Starlite parked in the same row as the EZs. After admiring these other homebuilts, the group departed for Hyannis to get some yogurt (an NEF tradition) and a stop at the Christmas Tree shop.

Settling sun splashed a brilliant red glow all over the western sky and glinted off the buildings of Boston. It was also breath taking as the sky darkened and the lights came on all over Boston. (Ed: We can see it, Bill; you write beautifully!) That was the end of another great NEF outing!

9/19/93: Time to weigh-in! Harlan Hill had the hangar set up with the load cells and cans to drain fuel. Carolyn had a luncheon spread with Texas sheet cake, Brownies, cookies, and grasshopper pie (with real cream de mint liqueur) ready for us.

The weighing went quickly for six EZs. No one liked the numbers they got. (Ed: Bill is talking about Paul & Barbara Adrien, Blain Boyd, Bob LaBonte, Frank Nowak, Bob & Dave Juliano, and Bill Dillinger & Linda's EZs. Well? Well, Bill, what were the numbers? Let's hear them. You all thought that your planes were heavy, yet you went out and had yogurt after all that rich food????! Shame on you! Oh, you people are bad--worse than we thought!)

10/18/93: Terry & Jan Schubert came to visit from OH. The Schuberts, Paul, and Bill went to Sanford, ME Airport Cafe for lunch. The next day they worked on Terry's plugged primer nozzles. Afterwards, Bill and Terry took off for a very special flight. They returned to Barbara's great meal, shared with the LaBontes and the Wrights, enjoyed the Schuberts' "laugh a minute" routine.

10/24/93: Flight of six flew over to the coast, circled Plymouth rock, down the coast, and along the Cape Cod channel. There they were joined by two more birds. Darryl & Nancy Wright led the pack for a while, then they broke off to take photos. (Ed: You are very lucky to have an official EAA Chapter news reporter/photographer like Nancy along on your outings. She is beautiful and amiable, too! Nancy, you do us proud!!!)

When the group landed at Hyannis as a flight of seven, led by the Wrights' in their BD-4, the ground controller told Nancy that "she and her playmates could taxi to parking." (Ed: Wish we could have been there to see the expression on Nancy's face!)

Practiced an "Adrien mile" to the Backside Saloon near the waterfront. Enjoyed a nice meal with a "laugh a minute" inspired by the Schuberts.

11/14/93: Paul Adrien and Bill Dillinger landed at East Hampton. Sid Stiber drove them to Shelter Island where he lives. (Ed: The Rest? Sid treated Paul and Bill to a day they will never forget. Sid and his lovely wife, Dottie, live in a paradise of their own. A private airport surrounded by trees. It takes you back to the good, old days.)

(Ed: THANKS, Bill, for sharing these incredible adventures with our members! So, Bill, it is now "Bill & LINDA DILLINGER"; we like the sound of it! This is fantastic news! CONGRATULATIONS, Linda and Bill!)

*** News on SHANNON STEWART, GALATIA IL: He is still flying his Varieze, N429T, and he is about half way on a Long Eze. He says it is very cold in IL, 9 degrees and -22 wind chill factor. He is planning to attend Sun 'n Fun.

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VARIEZE G-BVAY WING AIRLOADS UP TO 5G AND WING PANEL LOADS UP TO 4G AT MAX AFT C_og OF 102.2 INCHES

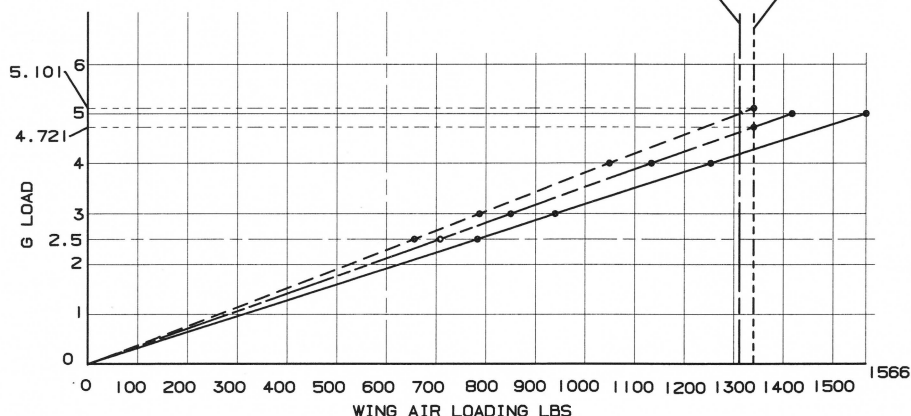
THE TESTED WING WEIGHS 50 LBS THE TEST LOAD WAS 1290 LBS
LOADED AS PER LAA/PFA LOAD SCHEDULE
EQUIV AIR LOAD OF 1340 LB

----- 1050 LB AUV
----- 1135 LB AUV
----- 1250 LB AUV

A/C AUV LBS	WING AIRLOAD AT 5g LBS	WING AIRLOAD AT 4g LBS	WING AIRLOAD AT 3g LBS	WING AIRLOAD AT 2.5g LBS
1050 AUV	1311	1049	787	656
1135 AUV	1417	1133	850	708
1250 AUV	1566	1253	940	783

RUTAN 1050 AUV WING LIMIT LOAD AT 5g=1311 LBS

TEST LOAD OF 1340LBS



VARIEZE G-BVAY WING AIRLOADS PER PANEL AT MAX AFT CENTRE OF GRAVITY OF 102.2 INCHES FOR 1250LB AND 1135LB MTOW AT 2.5G, 3G AND 4G
THE LAST COLUMN IS ACTUAL LOADS USED AND DOES NOT INCLUDE
A DISTRIBUTION OF THE WING WEIGHT OF 50LB WHICH IF ADDED
WOULD OFFER A MORE DIRECT COMPARISON TO THE AIRLOADS COMPILED

WING LOC'N	PANEL NUMBER	WING COEF	1250 AUV MAX AFT C _o g			1135 AUV MAX AFT C _o g			G-BVAY TEST LOADING LBS
			2.5g AIRLOAD 783LBS	3.0g AIRLOAD 940LBS	4.0g AIRLOAD 1253LBS	2.5g AIRLOAD 708LBS	3.0g AIRLOAD 850LBS	4.0g AIRLOAD 1133LBS	
ROOT	1	0.130	102.1	122.2	163.0	92.0	110.5	147.00	180.0
	2	0.125	98.0	117.5	156.6	88.5	106.25	142.00	170.0
	3	0.120	94.0	113.0	150.4	85.0	102.00	136.00	160.0
	4	0.115	90.0	108.1	144.0	81.0	97.75	130.30	150.0
	5	0.110	86.0	103.4	138.0	78.0	93.5	125.00	140.0
	6	0.10	78.3	94.0	125.0	71.0	85.0	113.00	130.0
	7	0.090	70.3	84.6	113.0	64.0	76.5	102.00	110.0
	8	0.080	62.3	75.2	100.0	57.0	68.0	91.00	100.0
	9	0.070	55.0	66.0	88.0	49.0	59.50	79.30	80.0
TIP	10	0.06	47.0	56.4	75.0	42.5	51.0	68.00	70.0
COL SUM		1.00	783.00	940.00	1253.0	708.0	850.0	1133	1290

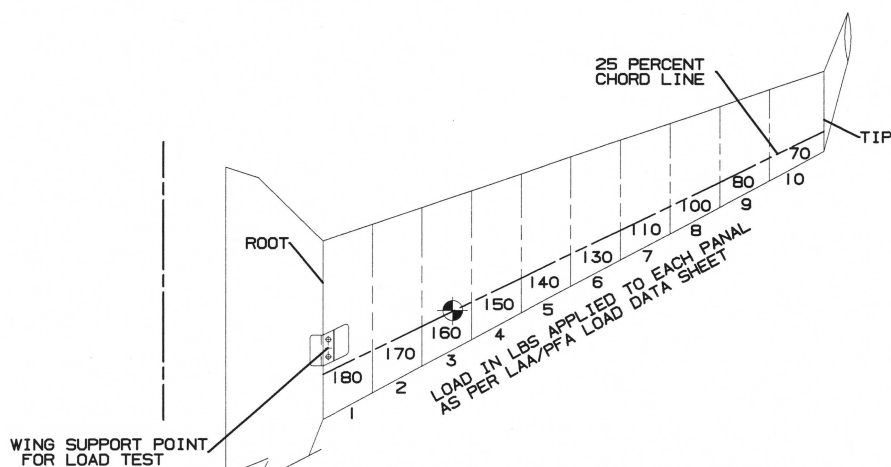
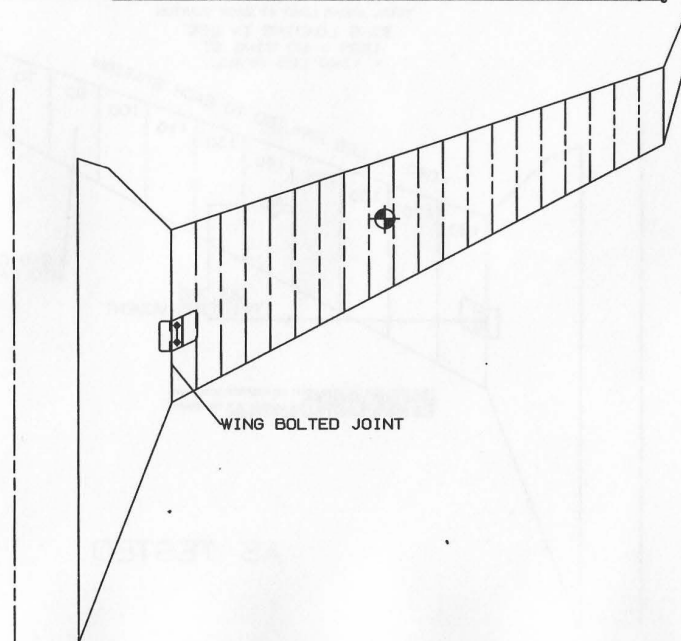
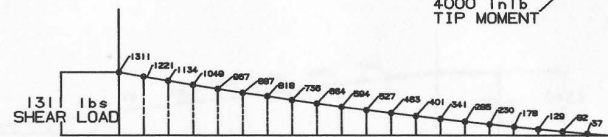
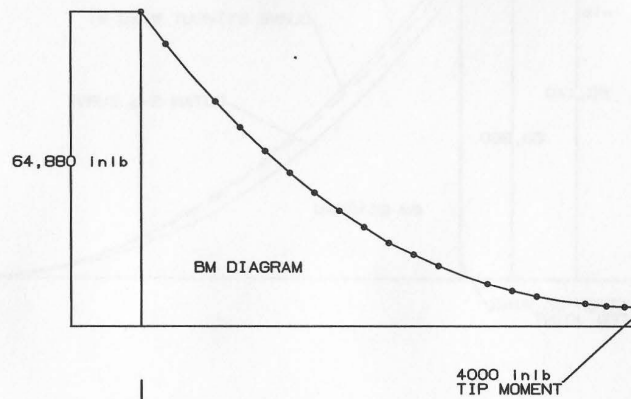


DIAGRAM OF TESTED WING

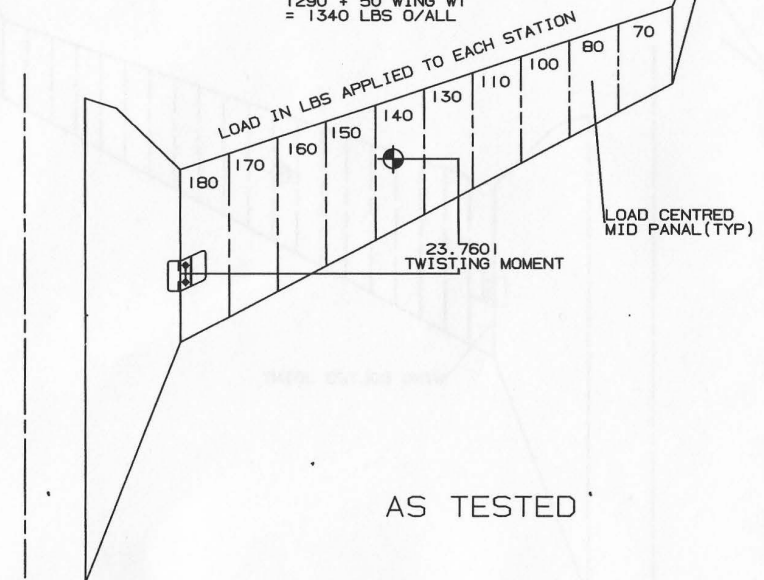
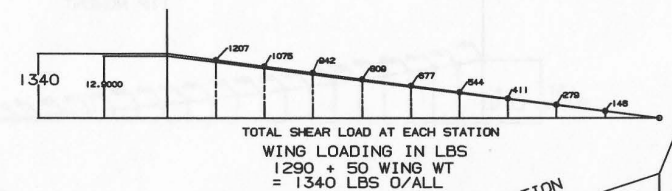
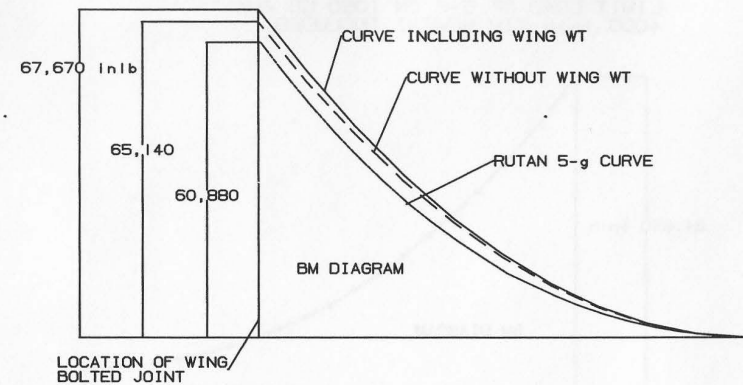
RUTAN RESULTS PLOTTED

RUTAN CANARD PUSHER REFERENCE CP21 PAGE 8
RESULTS SHOWN ARE FOR-
SHORTENED CANARD 142 INCHES
WORST CASE -AFT CofG LIMIT ie MAX WING LOAD
LIMIT LOAD OF 5-g ON 1050 LB AUW
4000 inlb TIP MOMENT INCLUDED



TEST RESULTS PLOTTED

RESULTS OF TEST CARRIED OUT ON VARIZE G-BVAY
TOTAL WING LOAD OF 1290 lb ON EACH WING
WING WEIGHT OF 50lb INCLUDED IN CALCULATION
NO TIP MOMENT



AS TESTED