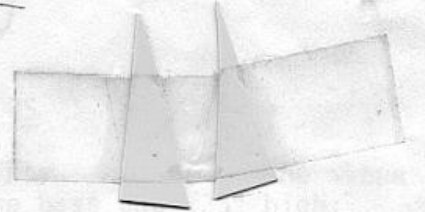


Q Corp VG Instructions

~~quickie~~



VORTEX GENERATOR INTRODUCTION

These devices were developed for the original GU canard to reduce the effects that rain and or bugs have on the wing's lifting characteristics. Although developed by NASA for use on a different airfoil they have proven to be quite effective on the GU when flying through rain. The droplets disperse, then run off in streams between each set of generators. Normally, of course, these droplets stay on the rear portion of the canard and show a separation of flow. After testing these devices, we have found that one can expect the following:

1. Slightly slower stall speed, depending on the original canard smoothness.
2. Much less trim change with rain and bugs. Approximately 2° of elevator travel needed in rain.
3. Lessens the need for reflex when landing with rain or bugs.
4. Increased initial drag of 3 to 4 mph. However, after a few bugs have accumulated -- no change.



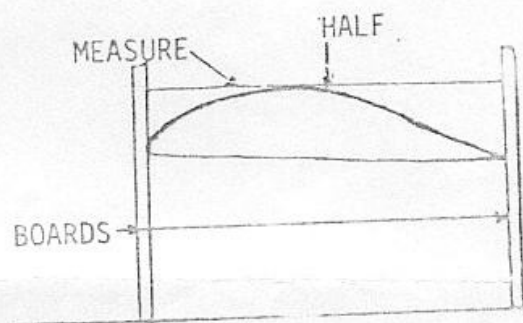
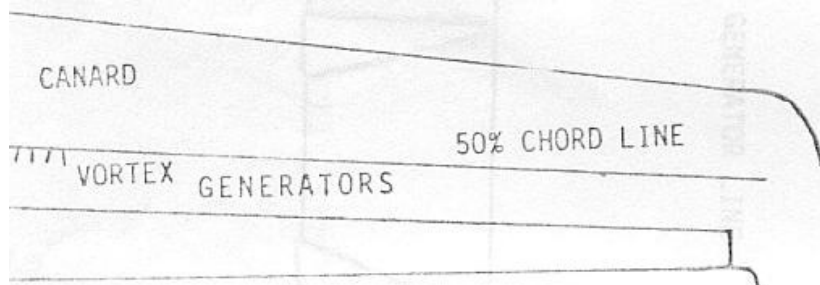
CONSTRUCTION OF THE GENERATORS

The generators are made from thin white plastic. They are made in the shape of a right angle triangle which is 1.00" long on the base and .35" high. Cut the plastic into strips that are .35" wide. Next cut into 1.00" lengths. Each of these may now be cut diagonally to form 2 generators. You will need about 70 generators per side. Cut extras so you will have spares.

VORTEX GENERATOR APPLICATION

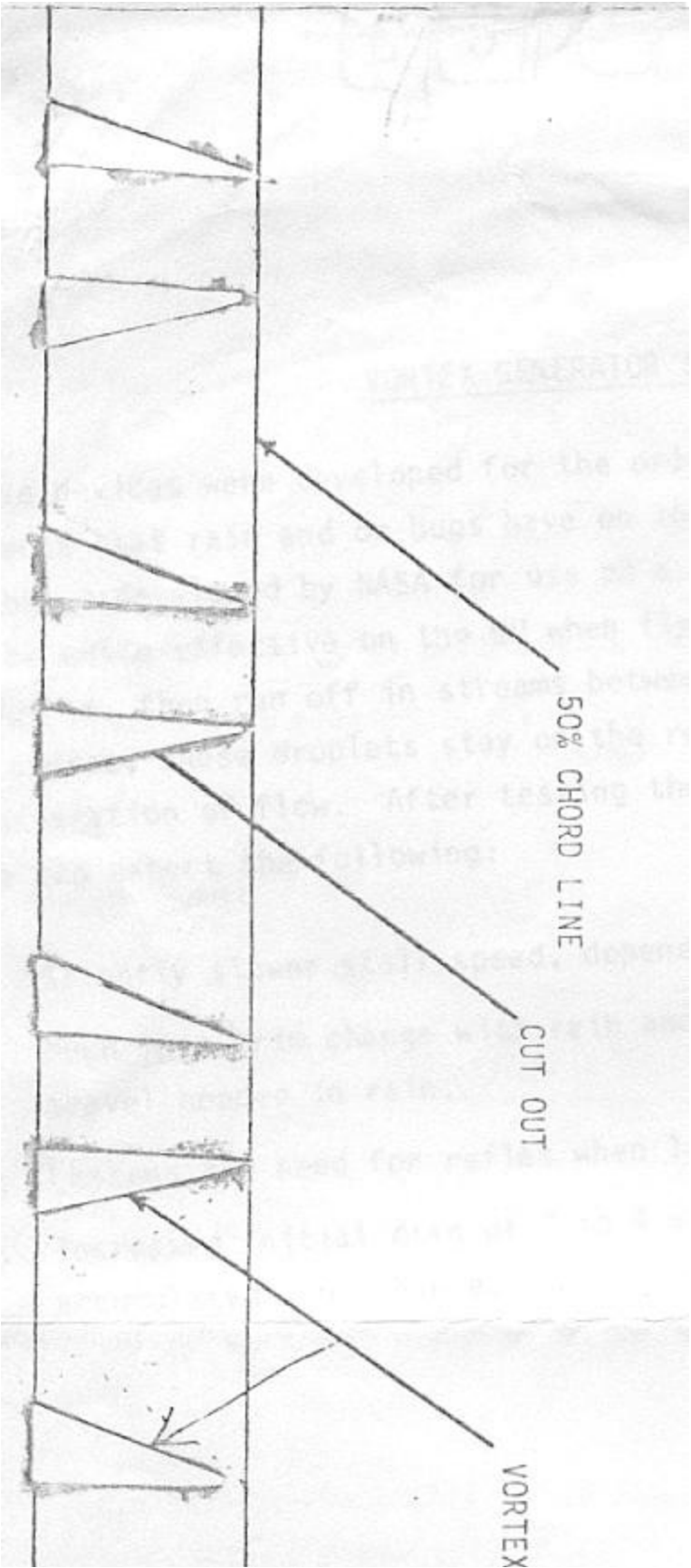
1. Establishing the 50% chord line:

Since there is quite a curvature on the canard you must prop boards up from the leading and trailing edges that extend vertically. This will enable you to measure between the boards to get the total chord then half that width down to the canard for the 50% chord line. Establish a point inboard and outboard so you can connect the two to make one line from one end to the other.



2. Establishing the Vortex marks and applying them:

After cutting your slot out on the template, lay it out so the front edge of the generator marks are on the line then mark them. Start about 4" out from the fuselage and go to the end of the elevator. Apply superglue to the generators and apply.



INSTALLING VORTEX GENERATORS

The VG's are easy to install and certainly worth the effort. On my Quickie(Q2 already had them) they completely eliminated any pitch change in rain. They lowered both the canard stall speed and cruise speed by a couple mph. Well worth the increase safety. The VG area is hard to wash with the VG's installed and folks have to play with them at fly-ins. Usually this knocks one or two off. While installing the last set I tried using clear silicone as the glue. So far it is working well. The silicone allows the VG to be a little flexible(when someone touches them) without moving while in flight. This helps with the number of them that are missing after a fly-in.

QAC originally recommended that the VG's be placed at a 20 degree angle to the airflow(Installation method #2). This angle has been experimented with and it has been found that a reduced angle can be used to reduce drag and retain the positive benefits of the VG's(Installation method #1).

Making the VG's:

Various thickness plastic sheet is also available at hobby shops, .016" thick is ideal. Plastic picnic plates from the grocery store also work well. You will need to cut out about 150 or so for a Quickie/Q2 type airplane. Each VG is a plastic right triangle, point forward, that is 24mm along the base and 7mm high. The base of each VG can be slightly curved to match the curve of the canard.

Establishing the 50% chord line:

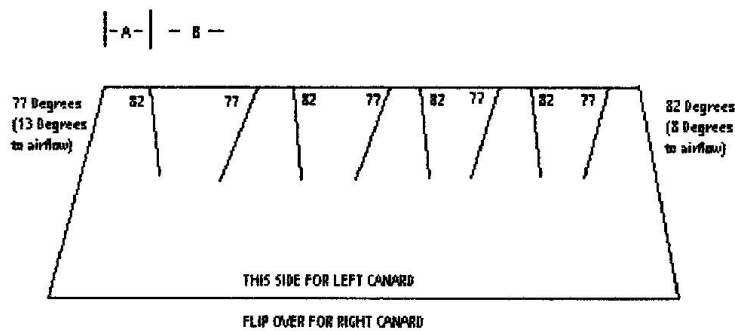
Raise the tail to flight attitude. Measure four inches out from the fuselage on one side of the canard. Place a level against the front of the canard and a level against the trailing edge. When both levels are plumb measure the straight line distance between the two. Place a mark on the canard at center. Move to the end of the elevator and repeat. Now draw a line connecting these two lines. Repeat on the other side of the canard.

Installation

Two methods for installation follow:

Method #1

For alignment make a template out of posterboard or card stock as follows: VG's on the left side of the template are angled at 77 degrees and VG's on the right side of the template are angled at 82 degrees. Distance at the leading edge between each of the two in a pair is approximately 13mm(A). The distance between the points of two adjacent pairs is approximately 36mm(B).



NOT TO SCALE

Hold the front edge along the mid-chord line and slide it along marking locations and angles as you go.

Flip the template over for use on the opposite canard. The VG's are applied in pairs.

Method #2:

Left Side Canard - Right VG's











- 1) Starting four inches out from the fuselage and continuing to the end of the elevator, place a mark every two inches on the 50% chord line.
- 2) From the first mark (four inches from the fuselage) measure a 20 degree angle to the airflow or buttline (hopefully both are the same thing!) and place a mark one inch aft of the 50% chord line. This is the location of the first VG. The trailing edge of this VG should taper towards the fuselage. If it does not measure a 20 degree angle and mark so that it does.
- 3) Starting from the aft end of the first VG place a mark every two inches one inch aft of the 50% chord line. You now have half the VG's on the left side located.

Left Side Canard - Left VG's

- 4) Place a mark $\frac{1}{2}$ inch outboard from the forward edge of the first VG on the 50% chord line. From this point place a mark every two inches on the 50% chord line. This is the forward edge of all the remaining VG's that face the opposite direction.
- 5) Measure a 20 degree angle (opposite the first set of VG's) from the forward edge of the first of the left facing VG's and place a mark one inch aft of the 50% chord line.
- 3) Starting from the aft end of the first (left facing) VG place a mark every two inches one inch aft of the 50% chord line. You should end up with markings that look somewhat like this $\wedge \wedge \wedge$.

Using whatever glue you have decided on, place a dab on the VG and place on each mark. Let dry and go fly!!

Files > Q Corp VG insructions

Name			Size	Creator	Created
	VortexG1.jpg		119 KB	johntenhav e 	Oct 1, 2002
	VortexG2.jpg		138 KB	johntenhav e 	Oct 1, 2002
	VortexG3.jpg		56 KB	johntenhav e 	Oct 1, 2002
	VortexGjf1.jpg		588 KB	johntenhav e 	Oct 1, 2002
	VortexGjf2.jpg		446 KB	johntenhav e 	Oct 1, 2002