

- (e) Fewer fixed surfaces have to be built.
- (f) Vee tail weighs less because of foregoing considerations.
- (g) The empennage is easily removed for trailage without affecting basic rigging.
- (h) Wind tunnel tests indicate good spin recovery characteristics.

The cockpit controls are entirely conventional. Were a pilot blindfolded and put in a sailplane incorporating the Vee tail he would be unaware of the unconventional empennage unless he chanced to look back and see it during his flight. The handling qualities are entirely normal. The sailplane can be sideslipped and can perform all normal acrobatics and in general handles exactly as if it had a normal empennage. It has no tricky characteristics.

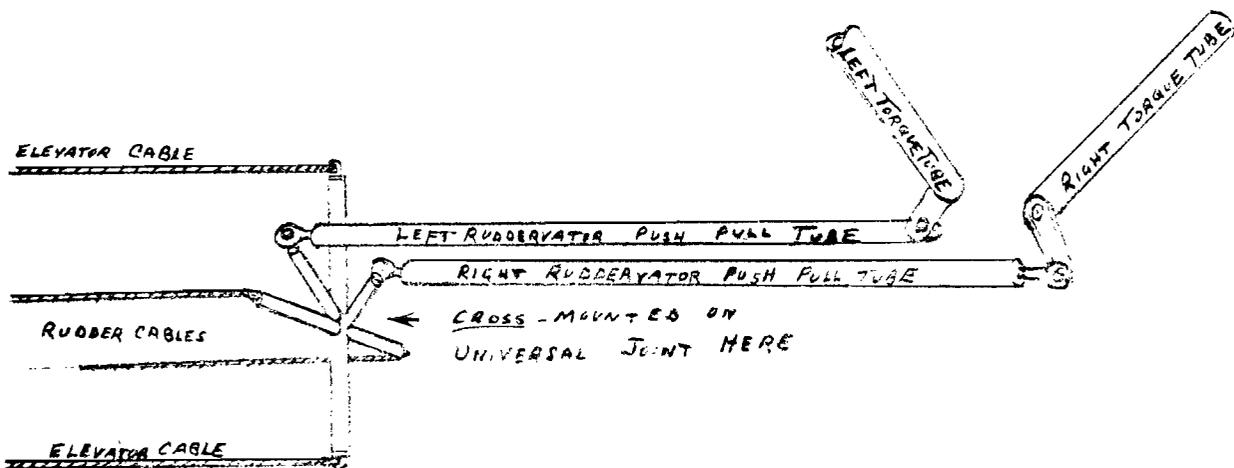
The Nomad empennage used 45° dihedral on each ruddervator (as they have been called) or a total included angle of 90° between the two surfaces. This value was rather arbitrarily chosen since the Nomad had excellent stability characteristics, and hence, needed very little elevator control but, because of its fifty-seven foot wing span, was originally somewhat deficient in rudder area. (All single seat sailplanes that I have ever flown have shown excessive elevator control and were deficient in rudder control.) The Vee tail, by having essentially twin rudders, partially overcame this defect, and hence, was a happy compromise. In general, I would recommend that anyone who wishes to convert his present sailplane (assuming its handling qualities are now satisfactory) to a Vee tail design should so arrange the Vee surfaces that

their horizontal and vertical components of area be equal respectively to the vertical and horizontal components of the original empennage.

The control mechanism by which this control is accomplished is in itself quite simple and is schematically shown by sketch herewith. Simple cable control from stick and rudder pedals are brought back to the cross located as far back as possible in the empennage from which push-pull tubes go to the torque tubes of the respective ruddervator.

On the cross are arranged diagonal arms actuating the push-pull rods so that if the stick is pulled back both ruddervators go up equal amounts together. If the right rudder pedal is pushed forward the right ruddervator will droop, the left ruddervator will be pulled up an equal amount so that the vector sum of the two forces applied to the tail of the sailplane ends up by giving purely a side load. Obviously any combination of rudder and elevator can simultaneously be applied. It is essential in the design of the control system that the travel available from a fully backward stick be so restricted that the rudder pedals do not cause the ruddervators to exceed their proper operating limits. In other words, I would recommend that full elevator accomplish about 15° of ruddervator travel and rudder accomplish 15° giving a total deflection of 30° .

Asking an inventor how he likes his device is similar to asking a fond parent how he likes his children. Be that as it may I am perfectly satisfied with the Vee tail arrangement and intend to incorporate it on any future sailplane which it may be my good fortune to design or build.



Sketch by author.