

from the start.

The CG position of your model will depend on the shape of the wings. As most modern jet aircraft have swept or delta wings, these are the two types that I will deal with here. With a straight wing the best position for the CG (depending on the camber) is generally considered to be approximately one-third or $33\frac{1}{3}\%$ of the chord from the leading edge of the wing, and this still holds good with the DF type of model.

With a delta wing, CG positions vary according to the sweep of the leading edge of the wing. I have set out a table below based on a thinned Clark Y section which I use and on my own experiments:

LE Sweep	CG Position at Root Chord with incidence of 1° - 2°		Stability out of 10
	With Reflex	Without Reflex	
40°	48%	52%	5
45°	50%	54%	6.5
50°	50%	56%	7
55°	54%	58%	8
60°	60%	61%	9
70°	61%	62%	6
80°	62%	63%	4

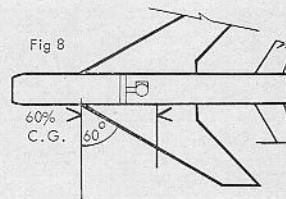
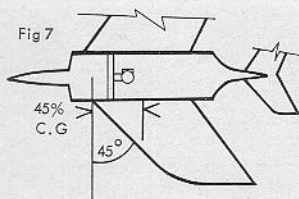
An average position of the CG on a delta plan form would therefore appear to be 58% without reflex on the trailing edge or 55% with reflex on the trailing edge. (Reflex = washout.)

With the swept-wing model, once again the CG positions vary according to the sweep of the leading edge of the wing, but are slightly different for the delta plan form. Once again I have set out a table based on my results:

LE Sweep	CG Position at Root Chord with incidence of 1°-2°		Stability out of 10
	With Reflex	Without Reflex	
40°	40%	44%	8.5
45°	45%	48%	9
50°	50%	52%	9
55°	58%	60%	8
60°	61%	62%	8.5
70°	61%	62%	4
80°	62%	63%	3

An average position for the CG on a swept wing without washout would be 55.8% and 53.8% for a swept wing with washout on the trailing edge. The variation between swept and delta wings is partly due to the "bite" out of the trailing edge of a delta shape thus forming a swept shape. It will be noted that the 60°, 70° and 80° swept wings have CGs in approximately the same positions as their delta counterparts.

I have gone through the CG positions for these types of wing at this stage because this is the other factor we mentioned with regards to the positioning of the fan and engine in the duct. I always try and arrange for my CG positions to be just behind the engine and fan. (See *Fig. 7.*)



Now, as I stated before, sometimes the position of the fan and engine has to be a bit farther back than one-third of the duct length. This becomes apparent when building a model which has a leading edge sweep 55°-60°, and this is because the CG position on this type of wing moves nearer the trailing edge of the wing, as can be seen in the preceding tables, and I have drawn an example in *Fig. 8.*