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Much confusion exists over what the "dive test" is and what it tells you. It is not a method to trim your plane for max performance. What it does tell you is the decalage angle (the angle between your wing and horizontal stab) and the resulting longitudinal (pitch) stability of your plane. From this you can infer your plane's relative CG position, which is the piece of information we are looking for. Notice I said that the "dive test" tells you (indirectly) where the relative CG position is, not where to put it. If you want to know where to put it for max performance, read an excellent article by Brian Agnew.

To perform the test, start from launch height, dive, release the stick and watch the flight path of the plane. If it pulls out of the dive quickly your plane has a relatively large decalage angle, has a forward CG, is pitch stable and will want to fly at one airspeed - the one it was trimmed for in level flight with the stab trim level. This setting is good for free-flight gliders and student R/C pilots.

The noseweight has the same effect at all airspeeds. The large decalage angle (up elevator) has a tail lowering force that increases with increasing airspeed and hence the rapid dive recovery. Likewise, if you get too slow, the heavy nose (forward CG) and lack of a tail-down force will lower the plane's nose to increase the airspeed to its "trimmed" value. If your plane makes a good gradual pull-out, you are somewhere between very stable and neutrally stable. This is the region I prefer.

If your plane remains in a 45 degree dive (do remember to pull out prior to reaching ground zero), it is neutrally stable. This is a good position for slope racing and F3B speed runs, because the plane goes where it is pointed instead of ballooning every time the stick is released or the plane is rolled out of the pylon turn. The pilot, however, must be proficient at "pointing" the plane. This means you'll have to "fly" the plane and constantly change or adjust your pitch to maintain the proper airspeed. You'll need a good view of the plane to fly it, and as such, this is probably not a good setting if you like to fly two miles downwind and have only average eyesight. I like to trim to this region then add a half ounce of noseweight and a clevis-turn of up stabilator.

If your plane tucks under by itself in the dive or keeps nosing up when you pull out of the dive, the plane has negative stability (or divergent stability). Whatever the airspeed trend is, it will tend to accelerate that trend. This yields a very maneuverable plane, but requires a fly-by-wire computer (like the F-16) to stop the divergent trends. Nobody wants to fly in this region, but if you like to fly with an aft CG and the plane doesn't want to trim out and "groove," you're probably slightly into this region,

Again, the dive test tells you about the decalage stability and CG position. It doesn't tell you where it should be for max performance.