Aircraft visibility

When a model airplane crashes, fault is sometimes loss of radio contact or even a mechanical failure. Quite often though the cause is simply that the pilot misinterpreted the airplane's attitude and reacted with incorrect inputs. This misinterpretation is directly related to how well we can see the airplane in what we're calling aircraft visibility.

Obviously we need to see the plane to control it, so the question is what are the factors that influence how well a model aircraft can be seen? Conditions would be one, and would include factors such as; sunlight, cloud cover, haze, etc. Then we have the physical aspect such as size of the plane, its distance from the pilot and color scheme of the plane.

We certainly have no control over the conditions, although we can choose not to fly in certain conditions but that's about it. As for size and how far away you fly, sure it would be nice to fly big visible planes or even in closer but that's not always practical now is it?

With the color scheme we do have plenty of control over that aspect and that's what we'll concentrate on in this article. Sure some colors are more visible than others and we'll touch on that more latter. What we need to concentrate on is contrast; which is a color or brightness that is dissimilar to its background. Keep in mind when it comes to contrast it is generally better to have a brightness contrast rather than a color contrast.

Now your first thought of having a contrast against a background might be in regards to the plane itself against a background of sky, trees, mountains, etc. That is an important factor because if a pilot cannot distinguish his aircraft from the background there is a technical term for that and it's called; screwed! An aircraft can have excellent contrast against the background but if all the pilot sees is just an airplane silhouette moving through the air, that's not good either.

By only seeing a silhouette of an aircraft in the sky the pilot may be able to determine it's in a bank but is unable to identify things like the top or the bottom of the wing which lets us know WHICH direction its banking. As modelers we try to make various parts of an airplane distinguishable for the others by creating contrast on the plane itself with various color schemes.

To tell one part of the plane from another at distance, we typically use a different contrast on the top of the wing as we would from the underside. When creating a contrast it is much better to use a color in different patterns instead of different colors in the same pattern. The reason is many colors can quickly become impossible to distinguish between on another as distance increases, while patterns are distinguishable much further. A starburst pattern both the top and underside of the wing in different colors would not be nearly as good as different patterns. A good example of using different patterns on different surfaces is the checker board pattern we often see on the underside of a wing.

There is a rule of thumb for patterns and it says the bigger plane, the bigger pattern should be. This is because the bigger the plane the further away we tend to fly. If the pattern is too small it too will also quickly become imperceptible at distance. To give you a starting reference point, the pattern size on a plane with a wing span of about 1.5 meters (60 inches) should be no less than 4 to 5 cm (1½ to 2 inches) wide.

To make sure a pattern has good contrast against the background we need to need to consider the colors we use. The accompanying graph is based on a study done by the German Air Force. They rated colors on a scale of 0 to 100, with zero being totally invisible and 100 being equal to a color visible under all conditions. So the obvious formula for creating a good contrasting pattern is to utilize colors from opposite end of the spectrum. Black on white would be an excellent example. Orange on white, on the other other hand, would be a bad choice.

Color Visibility Rating Under All Conditions
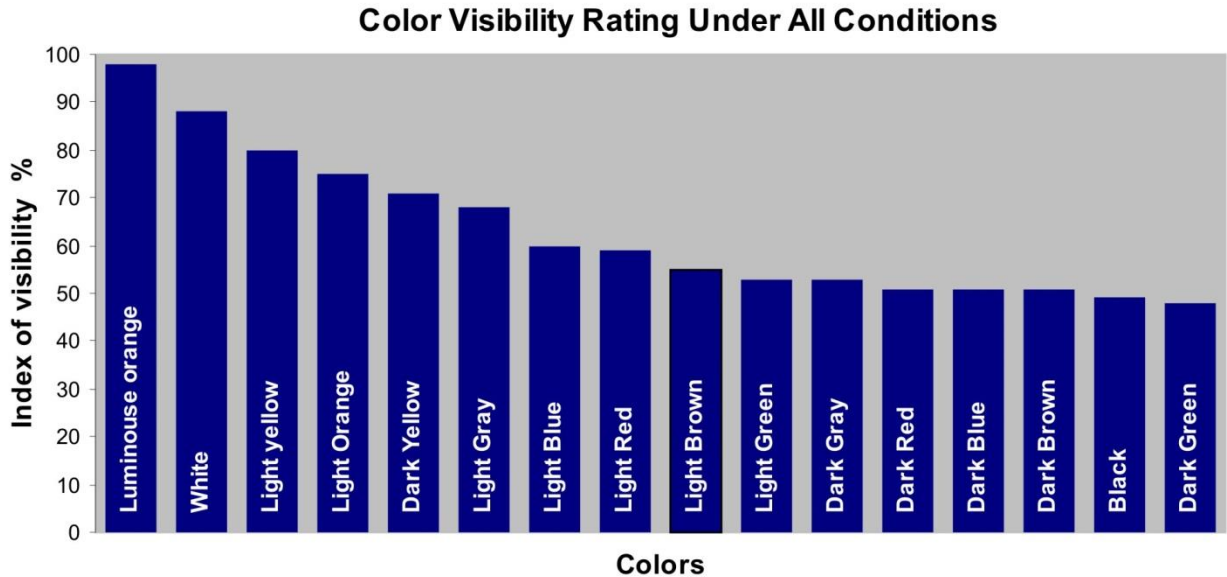
It pretty much goes without saying that kit or scratch built planes provide the greatest amount of flexibility for customizing a color scheme. Almost Ready to Fly planes (ARFs), on the other hand, come in colors and schemes decided by the designer or manufacturer. Many are decked out to make them attractive (marketable) or look like a full-scale counterpart. Unfortunately utilizing a contrast of color and patterns for good visibility is often not a priority in the ARF selling department. The visibility of any airplane can be improved with a little time, imagination, covering or self adhesive trim.