WINDY WEATHER PLANES

By Clay Ramskill

All too often, on an otherwise nice, but windy day, folks just don't fly. Obviously, for a beginner, that's just common sense - but for someone who has some experience, the wind should just be another challenge to add some spice to their flying.

While its easy to see that experience level has a lot to do with how much wind is too much, it may not be quite as apparent that the type of plane you're flying also can have a great effect on your ability to handle winds. Let's go through a bunch of airplane design features and see which ones give us the best flying characteristics to handle winds and the resulting turbulence.

Size: In general, the larger the plane, everything else being equal, the better it will handle winds of all kinds; they just don't "flop around as much!

Dihedral: The more dihedral in a planes wing, the more it is going to be affected by cross-wind gusts; it is hard to keep the wings reasonably level, and therefore lineup to the runway is difficult in a cross-wind situation.

Wing Loading: The higher the wing loading, the less a plane will be affected when hit with a gust.

Aspect Ratio: Lower aspect ratio (stubby) wings will be less bothered by gusts; there is less leverage for side forces to upset the plane, and the lower aspect ratio wing has a greater tolerance to changes in angle of attack caused by gusts.

Power: Pretty obvious - having the power to overcome the forces provided by the wind is a must. The same goes when you get into a sticky situation.

Lateral Control: Ailerons are very beneficial in a cross-wind, in landing and takeoff phases. The ability to dip a wing into a cross-wind without changing heading is essential, as is the ability to rudder the plane parallel to the runway heading while keeping wings level with aileron while landing.

Landing Gear: tri gear planes are easier to land and take off in a cross-wind than tail-draggers. And the wider the spread on the main gear, the better.

Maneuverability: This ones a bit harder to quantify. You want a plane with stability, yet you do need good maneuverability to cope with gusts. So you want a plane that is stable, yet responsive.

Wing Mounting: Generally, a low wing plane will handle crosswinds better. This is because the CG of the plane is nearer, in a vertical sense, to the aerodynamic center of the wing. So the low wing plane is not as easily rolled by a side gust. And by mounting the main landing gear on that low wing, we can spread them out wider.

It's unfortunate that almost every item above is in direct opposition to the characteristics found in a lot of popular trainers, the main exception being the requirement for tricycle landing gear. But even with trainers, there are differences; compare a Seniorita with the Cadet Mk2. While the Seniorita may be a bit slower and a bit easier to fly, the Cadet, with its ailerons, higher wing loading, lower aspect ratio, and lower dihedral, is a far better plane flying in windy conditions.

Going a step further with the same kit manufacturer, their Cougar(.40)/Cobra(.60 size) kits embody ALL the right characteristics for windy flying.

And in closing, I offer Confucius' only known saying about R/C flying – "To learn to fly in wind, one must fly in wind!.

When Your Plane Tries To Tell You

By Clay Ramskill

Once upon a time your author had a new pattern plane. On the first few days of flying it, everything was fine. But one day, on the first flight, it required several clicks of down trim (odd...) after take off -- and after each turn or maneuver, the pitch trim would be off again (VERY odd...). Only when it took full down stick to fly inverted (JEEPERS!) was your author smart enough to realize something was wrong. After landing, the problem was obvious: I had not bolted the wing to the fuselage!

But the plane DID "try to tell me"; I just wasn't listening. Only new, tight-fitting wing dowels had saved the plane from destruction – it certainly wasn't the pilot! Recapping later, I thought of a number of things that would have caused similar symptoms: servo or servo tray loose, bad servo centering, broken elevator hinges, loose control horn, et cetera. The point is, ALL of those things are BAD! And with the plane not behaving properly, WHY did I keep flying?

Just suppose you're getting an occasional glitch from your radio; something that doesn't normally happen. This could be an antenna problem; it could be metal-to-metal vibration causing home-grown interference, or a loose crystal.

Will any of these get better while you keep flying? And speaking of vibration, what if you start hearing it in the air? It's your plane talking to you -- loose muffler, engine mount, worn wing dowel holes, loose cowl mounting. Again, such problems don't get better, only worse.

One more example -- this has happened to all but the most careful pilots. Your engine goes lean and sags at the top of a loop. It's TELLING you that the mixture is too lean. But you don't listen and keep flying; a minute later, while doing another loop, you're suddenly dead stick!

The sky gods know -- we have enough problems that pop up suddenly, and we don't have any opportunity to prevent them. Other times the plane "tells you" that there is, or will be, a problem. Unless you really enjoy repairing or rebuilding -- LISTEN! Cutting a hop short to check out a possible problem is much quicker (and vastly cheaper) than building another plane!

DUAL RATES - the Good, Bad, and Ugly

by Clay Ramskill

Usually found on radios with 6 or more channels, dual rates allow you, with a flip of a handy switch, to change how much servo response you get from a movement of your control stick. There is a switch for each channel involved, and an adjustment for each which allows you to "dial in" how much less response you'll get with the dual rate "on".

Dual rate use is fairly simple - with the dual rate "off" you get normal response; that is, full servo rotation with full stick deflection. Turning dual rate "on" you get only a certain percentage of the servo rotation you would normally have had at any stick deflection. That percentage is what you control with the adjustment on the transmitter.

This is a nice capability - your plane can be set to be wildly responsive for aerobatics, yet with dual rates on, you can still fly very smoothly, for landing, for instance. Pattern fliers use this a lot.

THE GOOD. You could set your plane up such that with dual rate on, the elevator travel isn't enough to stall the plane, allowing smooth, stall-free flight. Turning the rate back up then would allow such maneuvers as snaps and spins. Some folks use dual rates for landing only, to stop over controlling at slow speeds. Dual rate capability is super for test flying a new plane, when you're unsure of just how responsive the plane will be. The possibilities are near endless.

THE BAD. The radios with dual rates cost extra bucks. You have more switches to twiddle with, and to check before flight. And in dual rate, you're not using all your servo travel - they will not be as accurate as they are using full travel, nor as powerful.

THE UGLY. The problem is, that you get used to having a certain response from your plane, and expect that response all the time. With dual rates in use, you must remember whether you're "in" or "out" at all times so you know what responses your plane is capable of. A BUNCH of planes have been crashed that way; the pilot wondering why his plane wouldn't pull out of a loop like it normally did! Or on dual rates, the plane couldn't respond quick enough to overcome some turbulence on landing.

The Bottom Line. If you have dual rates and use them, you've got to know at all times where those little switches are set. If you don't use them, set them such that if the switch is turned on, you still have 100% travel; that way, it doesn't matter where the switch is. NEVER set the rate such that the plane is un-flyable or only marginally controllable with dual rate "on". You all know how Murphy's Law works, right?