

The energy merge

by sick

well, i havent blasted out a good long book about ACM in a while, so i thought i'd lay one on you guys today, heheheh. must be something in the air.

the merge is everything. you win or lose the fight in the first few seconds. the evolution of a particular pilots merge is usually the evolution of their skills in general.

most start with a hard break turn, trying to come around as quickly as possible. they start the turn as they pass the bad guy, and then whip it around.

the next step is usually cognizance of the vertical; a little experimentation with nose down reverses is usually fatal, resulting in the merge most often seen: the hard immelman. upon passing the bad guy, they pull nose up and come around the top as hard as they can.

next, someone tries to teach them the lead turn. they then try to pull their nose up in an immelman **before** passing the bad guy, to get a jump on his turn. maybe they even stop taking the head on shot, and start calculating their lead turn timing based on closure velocity, and include a small jink to spoil the bad guy's head on shot.

inevitably, they begin to think about energy. the hard immelman gives way to the soft immelman, and an energy maximizing zoom climb. the pull up becomes softer, the climb longer, ending either in a hammerhead or a gentle flop over the top. they experiment with how much velocity they should retain before pulling over the top.

the occasional practiced duellist goes a step further, with techniques like eadg's 5 count merge (a lag, rather than a lead, immelman). the gentle balance between energy and angles is explored.

with all this in my head, i was convinced i understood the merge pretty well. but i was a bit confused; Shaw recommends never going vertical in the merge. "how can this be?" i thought. how can the horizontal, the initial dweeb break turn, be superior to these honed and practiced vertical moves which i had been slaughtered by and spent much time mastering? i thought, "maybe Shaw is wrong, or he's thinking only about jets."

so last year, at the WB con, i asked him point blank. "hey Bob, why not go vertical on the merge?" "because you don't know the enemy's energy state." huh. but i do, dont i? i mean, i can judge closure and altitude, right? maybe Shaw is wrong, or thinking about jets again.

well folks, Shaw hasn't been wrong yet, and if he'd been thinking about jets he would have told me so. i spent a long time reading his section on 1 v 1 merges, both angle and energy merges, diagramming them, rereading them, and trying to figure out what was behind them. how can the end game be a rolling scissors? shouldnt it be a distinct advantage? whats up with this damn nose to tail horizontal turn anyway?

the basic problem was that Shaw expects the opposition to be perfect. in WB, you can get away with all kinds of stuff, because the bad guy is just as often a 15 year old kid with a gamepad as 1000 hour veteran with cold eyes and a black heart. but in Shaw's world, the bad guy is always an expert, and he's there to kill you, not ruin your score.

Shaw's energy merge is far more careful, methodical, and brutally effective than any of the merges i've discussed so far. its suitable in a 1 v 1 fight, and doubly so in a multiple participant fight, or a fight in which a new bandit could show up at any time. i'll describe it as best i can.

when you merge with the bandit, maintain some horizontal flight separation. this means that instead of putting your nose right on the guy, put it a hundred yards or so off to one side. let him pass you by, don't attempt a lead turn at this stage. when he passes you by, keep your eye on him, and adjust your course, but only slightly, to make sure you can. don't climb, and don't dive.

watch what he does. especially, watch which way he turns. there are a few possibilities for what he will do here:

1. make a nose down reversal of some kind
2. turn in the horizontal
3. turn obliquely; some in the vertical, some in the horizontal
4. turn in the pure vertical, nose up
5. he appears to do nothing

case #1 is the easiest. when he goes nose down, keep an eye on him, turning slightly if you have to to keep him on your tail (i.e. turn away from him, not towards him). when he is half way through his reversal, initiate a gentle immelman. if he is in a pure split-s, use a pure immelman, otherwise use an oblique pitchback to keep him on your tail (i.e. all nose to tail turns here). you will come out of this facing him with a massive energy advantage. don't try to press the attack now; instead, go through a second merge to build even more advantage.

case #2 is pretty close to the same. turn nose to tail away from his flat turn, keeping him on your tail. i call this "stringing him out". he makes that hard reversal, only to be left far behind you, and with no airspeed to catch you. when he is most of the way through his reversal, execute an oblique pitchback as above. again, prosecute a second merge before pressing the attack.

case #3 is tricky. he is conserving energy, so you have to watch him closely. again, turn nose to tail to string him out, but what your watching for is the peak of his zoom climb. when he is brings it over the top, whether its with an immelman, a hammerhead, or whatever, this is your moment. he should be directly behind you due to your nose to tail turn. execute a pure vertical immelman. when you merge again, you will have a slight energy advantage. as always, dont blow it by pressing it too early. allow another merge, and build more advantage.

case #4 is tricky as well. he isnt turning in the horizontal at all, so you can't use a nose to tail turn to string him out. however, you can use a slight nose to tail turn to force him to either alter his immelman midway in order to stay on you, or exit the immelman facing the wrong direction. gently make about a 45 degree turn, preserving your airspeed. when he compleats his reversal,

and you've completed your gentle turn, execute an immelman of your own. you will have an energy advantage at this point, but it will be slight. again, another merge will be required.

case #5 means the guy is either leaving the fight, or is waiting to see what you do. knowing which it is can be tricky; if he's leaving, you want to immelman as soon as possible in order to catch him. if he's waiting on you, acting too soon could give him the advantage. generally, if he hasn't done anything by the time i reach a 10 count, i reverse and chase him.

one of the keys in this careful game is the follow on merge. its likely to be just as dangerous as the first, and you will come out of your initial reversal with a much lower airspeed than you had going in. but you will also have more altitude; its time to trade it back in. the second merge should ideally be executed at the same altitude the first merge was made at. dont try to horde a little altitude and end up going into the merge without sufficient airspeed for crisp vertical maneuvering. you'll stall out, and thats usually fatal. dont worry if the bad guy holds on to his altitude. remember that means he is slower than you, and may not be capable of a vertical maneuver.

use a shallow, unloaded dive when approaching the second merge. that means, get your G meter to 0 G's and leave it there. an unloaded dive maximizes your airspeed while losing as little total energy as possible (dives always give up some energy). dive enough to get vertical maneuvering speed in your airplane, and maybe a little extra if you can afford a little extra altitude loss. in any case, dont bother having any altitude advantage in the second merge that you don't need; trade it in for airspeed.

prosecute the second merge exactly like you did the first one, with the same set of responses. in most cases, the second merge will leave you with a tremendous advantage, and it will be time to initiate a boom and zoom attack on the bad guy.

this kind of merge isn't just for fast fighters; its for any airplane that can hold and maintain an energy advantage. i did this last night consistently with an A6M2, often against multiple opponents. what the zeke lacks in speed it has in climb and efficiency in a reversal.

ok, i think thats a good start on this topic. feel free to ask me any questions, or make any comments.

JUB!