

56th FG

Group Training Documents/Individual Piloting Skills

Overview

This document details the skills required to become an efficient fighter pilot capable of coordinated action against hostile aircraft. The pilot is requested to gain all of the capabilities described herein, and will receive tuition as necessary before joining Squadron and Group combat missions.

Engine and trim management

The aircraft engine in WWIIOL:BE is a simplified model of the real thing, and its three RPM states Economy, Continuous and Max is actually a combination of engine RPM and propeller pitch control. In the default Economy RPM the engine runs at reduced power and the prop is set to "fine" pitch, meaning that it does not "bite" as much air as with the other two RPM settings. In practical terms, use of RPM is governed by circumstance:

- Economy – use it for level flight to cut gas consumption and reduce engine temperature.
- Continuous – use this setting for normal cruise and climb, and to increase airspeed in radical dives.
- Max – use max RPM for takeoff, landing, combat and aggressive climbing. Max RPM bites deep in the air and has a braking effect during dives.

In addition to these settings, the aircraft is equipped with War Emergency Power (WEP) which increases boost, although this also increases wear and tear and eventually causing the engine to overheat. WEP (default: F8) can only be used for up to 5 minutes without the engine failing catastrophically – keep an eye on the engine temperature gauge! Ideally, you should never have to resort to WEP but rely on other advantages instead.

If you have taken damage to the engine or its subsystems (oil, coolant) you will eventually hear a ticking sound indicating a strained and overheated engine. In such case, immediately set to Economy RPM and reduce throttle to below 50% to maximise your stay in the air. If you hear a strongly ticking sound, shut down completely and make an emergency landing.

Trim control is most important. Your chief worry is elevator trim (I, K). The objective of controlled flight is to achieve a stable hands-off-stick state, i.e. to trim the aircraft to a neutral state at the speed you are currently at. Because you will change airspeed constantly throughout a sortie, you must ever be mindful of your trim state. As a rule of thumb, punch "K" repeatedly for climbing and curving combat, and punch "I" repeatedly when committing to a power dive.

Taxi, takeoff and landing

Upon spawning, the tailwheel is locked to align with the fuselage. To taxi, start the engine and knock the throttle forward just a tad to start rolling. To turn, unlock the tailwheel (-) and touch the brakes (z, x) gently to swing into the desired direction. Note that the tailwheel swings freely. To stop, cut throttle and apply both brakes. You may also steer with the rudder while the tailwheel is unlocked.

Takeoff is effected with locked tailwheel, at full throttle and max RPM. Shortly after the aircraft starts rolling, push gently forward to lift the tailwheel off the ground. Engine

torque will swing the aircraft either to left or right depending on which way the propeller turns. Counteract this swinging tendency with opposite rudder, and if you do not have rudder control, with short bursts of opposite brake. If the wing dips, counteract with opposite aileron (e.g. left wing drops, move the stick gently to right). Do not yank the aircraft into the sky – set trim to tail heavy, let airspeed build up by using the whole length of the runway, and nudge the crate up by gently pulling back as speed exceeds 120-150 km/h. Watch out for trees and hangars, and retract the landing gear as soon as you are airborne. Flaps are not required for takeoff unless you are heavily laden or face a short runway.

Landing is important: you do NOT want to prang your crate when returning with a bagful of scalps! Key to landing is to control the descent with throttle rather than pitch. Here is how to do it:

1. Fly parallel past the field at approximately 1 km altitude on the so-called downwind leg, engine at max RPM and idle throttle to shed altitude and airspeed. Deploy flaps and gear as your airspeed drops below 200 km/h.
2. As you descend to 500 m altitude, turn 90 degrees – you should now be perpendicular to the intended line of approach and a good way out from the field. Power up gently to avoid stalling as you turn.
3. Make a second 90-degree turn to come onto the glidepath on final approach and continue sinking with the prop just above the horizon. Manage your rate of descent with throttle only, do not point your nose below the horizon (i.e. directly at the field). If you are too close, too high and too fast, go around for another try. If you come in too low, increase throttle until you regain the proper glidepath.
4. Crossing the field boundary and approaching the ground, chop throttle entirely and nose up slightly (“flare”) as you set down the aircraft. Pump brakes gently and intermittently, and come to a full stop without digging in.

Situational awareness

The most important factor in all your flying is the ability to look around you and make mental notes of everything that goes on. You must constantly scan the surrounding airspace for other aircraft both enemy and friendly, for terrain references and for signs of combat. Constantly means just that: you cannot relax your all-round scan even for a second – it only takes the enemy a few seconds to fall in on your six and gun you down. Establish a routine for scanning: front, sides, high front, level rear, low six, high six, back to front and so on throughout the sortie.

If you, God forbid, fly alone, you must fly a crooked course through the air, rolling and weaving to check your high and low six all the time. This is extremely taxing, and many a pilot relaxes his vigil after a few minutes because it is so incredibly boring to look around himself. That is when the enemy pounces!

Because of this, 56th FG has adopted the line abreast formation, meaning that two or more aircraft fly parallel to each other and separated by some 100-500 meters depending on circumstances. In this configuration, also known as “Finger Four” and “Combat Spread”, nothing in the surrounding airspace escapes attention, as long as the pilots keep looking “inwards” to clear each other visually, as well as keeping up the all-round scan. We will talk more of this in the Tactics and Procedures document.

Situational Awareness (SA) is all about knowing what goes on around you and adopting to the constantly changing situation. SA is about asking yourself a set of questions, again and again: Where is the enemy? Where is your wingman? Where is the enemy coming from and at what altitudes? Where should you go next? Can you attack or should you disengage? Where can you expect AA? Is the enemy regrouping or fleeing?

These questions must run constantly through your mind, and you should never be found wanting for answer.

Basic Flight Manoeuvres – BFM

Climbing

Climbing is pretty straightforward: when in level flight and trimmed to a hands-off neutral state, trim tail heavy (K) until the Vertical Speed Indicator (VSI) indicates an ascending attitude. You will want to climb at a sustained pace, usually at around 180-220 km/h, to strike a balance between climb rate and forward speed. Only in extreme cases should your airspeed fall below 150 km/h, as this makes you an easy, almost stationary, target.

Diving

Diving is also easy: simply trim nose heavy (I) repeatedly until the nose points down. Be careful not to exceed 650 km/h or thereabouts, as your elevator and ailerons will become locked by the blistering airflow and conspire to throw you nose first into the ground. A radical dive is best initiated with a wingover to avoid red-out and carburettor cut-out: roll to inverted and pull into the dive, then roll again to put your canopy sunny side up.

Turning

To turn, kick rudder in the turn direction while rolling and pulling to initiate a change of heading, or simply roll and haul back without using rudder. For sustained turning, always trim tail heavy (K) in order to relieve the need for elevator input – this will give you more stick throw and tighten the turn against an enemy who does not use trim in the turn. Always strive to make your turns deliberate but avoid pulling so much as to black out – if you do, you lose sight of the bandit and must pull yet more at a later time to regain SA, burning precious energy in the process. Because all turns costs energy and slows down your airspeed, you must always trim tail heavy to get the most out of your crate. Remember, the faster you go, the less G's you can pull.

Aileron roll

Simply push the stick fully to the side and hold it there until you regain a sunny side up attitude. The aileron roll can be sustained until you lose your bearings completely :)

Barrel roll

If you pull back on the stick while rolling, you will inscribe a spiralling path through the sky. From a level starting point, quarter-roll and pull gently to start the manoeuvre; release backwards pressure while continuing the roll, then pull again. Keep rolling and pulling judiciously to maintain the barrel roll: the more you pull, the wider the motion. This is an effective manoeuvre against a bandit coming in guns hot from any direction and especially from six o'clock.

Skid

Push the stick sideways while tramping down opposite rudder. This burns energy effectively and may help you to flush forward a bandit close on your tail.

Stall and spin recovery

When airspeed drops below 80-100 km/h your aircraft loses lift and drops like a stone from the sky. To recover, simply let go of the stick and allow airspeed to build up again. If you get into a spin, immediately release stick pressure and hold rudder opposite to the spin direction. I.e. if you spin to the left, give full right rudder to counteract the spin. Take care not to enter a new spin in the opposite direction! Exiting the spin you will need to dive to

regain airspeed, since you will likely be fully stalled out. You may easily lose 2-3000 m in a fully developed spin.

Pursuit modes

The objective of pursuit is to close with the enemy (or the leader), or otherwise manage separation. Depending on the relative airspeeds you will have to employ different kinds of pursuit in order to put yourself in a profitable position.

Pure pursuit

Point your aircraft directly at the enemy (or leader) in a situation where you have good to moderate closure.

Lead pursuit

If the target is faster than you, point your aircraft well ahead of the target in his future flight path in order to "cut across the corner".

Lag pursuit

If you are considerably faster than the target, steer well aft of the target and cross over his track before setting up pure or lead pursuit.

Advanced Combat Manoeuvres – ACM

The following manoeuvres, briefly explained, are the bread and butter of one-on-one combat. If you do not know how or when to execute any particular manoeuvre, please do not hesitate to discuss the matter with Group personnel.

Chandelle

A wide climbing turn employed to regain a position of altitude advantage against a slower target.

Looping

The looping is not a combat manoeuvre. Nose down to build airspeed and pitch up to perform a circle in the vertical plane. Exit the loop in the original direction of travel and at the same altitude.

Immelman

Also known as "half loop" and used to reverse heading in the vertical plane. Pitch up and hold backward pressure until inverted, then half-roll to come sunny side up, heading in the opposite direction.

Split-arise

The Split-S is used to reverse heading with a downward vertical assist to increase airspeed, and is also useful as an evasive manoeuvre. Roll inverted and pull until you are heading opposite to your original heading.

High Yo-Yo

The high Yo-Yo is used to maintain a rear-aspect position when you have considerably more energy than the target. When aft of the target, pitch up and roll while pulling to bring your nose toward the target, then slide down into his low or level six o'clock.

Low Yo-Yo

The low Yo-Yo is used to cut across a flat turning circle with a vertical assist. When fully banked and hauling back to turn, exaggerate the roll with 45 degrees and "dip into the bowl" to cut across. Either go for a lead pursuit shot or recover slightly high behind the enemy before saddling up for a tracking shot.

Boat turn

The boat turn is a tricky manoeuvre which only works against very greedy or very inexperienced enemy. Push full rudder while giving sufficient opposite aileron to maintain a wings-level state. You will eventually turn fully around, although at the price of a considerably reduced energy state.

Hammerhead

The Hammerhead (aka Military Wing-over) is best used against ground targets. Following a gentle dive, pitch up to near vertical and hold that attitude until you are riding the stall. Give full rudder, preferably in the same direction as the propeller turns, and recover with a bit of opposite aileron to point straight down at the target.

Cuban Eight

The Cuban is best used against ground a target that does not fire back. Following a strafing run, continue 1000 meters and then pitch up for an Immelman turn. Once over the top and heading down, roll to bring the canopy sunny side up and continue down toward the target. Rinse and repeat.

Rope-a-dope

With a considerable energy overhead, chandelle around the enemy while keeping him just forward of your wingline in order to lure him into a lead pursuit. Continue the spiraling climb until you see him stall out, then head down and gun his brains out.

Lag roll attack

A high yo-yo which involves a roll-away high in the bandits rear hemisphere to keep him in view. When fully inverted above the target, haul back and slide down for a lead pursuit snapshot.

Flat scissors

A series of S-turns in the horizontal plane that serves to produce an overshoot of a bandit currently at your six. Reverse the turns so as to bring the enemy out of sync with your turns. You will either flush him forward or bring the fight to a nose-to-nose contest, allowing a guns situation or a clean opposite heading getaway, whichever you desire.

Rolling scissors

Start a barrel roll and manage your forward velocity by amplifying the vertical element to flush a bandit forward from a stern starting position. Always watch the enemy closely throughout the manoeuvre! The rolling scissor can also be a single deft barrel roll against an enemy coming in from your side. Pitch well up and roll over and around the bandit as he blows past, then slide in behind him.

Defensive spiral (up)

Use the defensive spiral against an enemy coming in with a ton of smash in your rear aspect. Turn while climbing, and trim tail heavy (K) aggressively to maximise the spiral.

Defensive spiral (down)

With a bandit at your six, dive and turn with closed throttle. Deploy flaps momentarily to slow your speed yet further until the bandit is flushed down parallel or in front of you.

Hartmann Escape

When all else fails, push the stick forward into a corner while giving full opposite rudder. Neutralise, regain vision and SA, and consummate the escape.

Boom and Zoom

Attack from a position of great altitude advantage. Employ lead pursuit and zoom gently back to altitude following each guns situation. Disengage before your advantage erodes.

Gunnery

Set your convergence to 100-150 meters (.conv XXX) and get real close before letting rip. Fire steady and concentrated bursts of 2-3 seconds duration. Aim for engine, pilot, fuel tank or wingroot, in that order. That is all.

Guns defence and evasion techniques

Key to guns defence is to move your aircraft outside the bandit's guns envelope at a high rate, and to time the manoeuvre so that the enemy does not have time to react and reciprocate to your change of direction. To evade successfully you must fly so as to pass the enemy as close to head on without allowing him a good shot, and then continue away at an opposite heading. Correct your heading after the pass only so much as to keep him in view.

Radio Discipline

Broadcast your actions and sightings promptly and efficiently, with as few words as possible. Begin transmissions with your callsign unless the recipient cannot fail to identify you. E.g: "White Two, con low nine, over", "White Two, in in in", "White Two, out west and low, over", "White Two, dragging three oh-nines west past Feschaux on the deck, over", "White Two, say again, over", "White Two, unable, over".

Cave Tonitrum!

Johan "BMBM" Kylander, Commanding Officer 56th Fighter Group
"This is Yardstick. Follow me."