



X51 TRAINING MANUAL

-War Thunder Specific-

By =X51= BrodyZ_ch and =X51= Poetic

Terms, Phraseology, and Standard Operating Procedures (SOP's)

Before Takeoff / Takeoff: When in formation, your callsign is your number in the flight. **Before takeoff**, lead will assign numbers and positions within the flight, then give a **short brief** with takeoff and climb-out instructions, including the desired formation(s) to be used. When lead addresses the flight as a group, each member responds with their number.. Ex: "Two copies" or "Four Tally/Visual".

On takeoff, the lead will call configuration settings, then announce, "One's rolling" after which each other member of the flight will **announce** their takeoff roll ("Two's rolling" etc..) about 2-3 seconds or so after lead. The lead will call for gear and flaps up and when to tighten into the desired formation on climb-out. When in position, call "(#), in position".

Directional References and Contact Calling: In order to quickly reference the direction of a threat it is often most efficient to call out it's position from 1-12 based on a clock. If available, degrees (0*-360*) or compass orientation (Ex. N, S, E, W) are also acceptable. A 6-o'clock indicates the rear of an aircraft, 12-o'clock the front, etc..

When anyone in flight see's a **new, unidentified aircraft** ("bogey"), they report it using, "CONTACT, clock position & alt, aspect". Ex: "CONTACT, 11-o'clock high, hot" or "CONTACT, 2-o'clock same altitude, flanking left to right" (use hot, cold, or flanking for aspect descriptions). The rest of the flight will look for a visual confirmation of the new bogey and call out their visuals as they see them along with their flight numbers (Ex: "visual", "tally", "eyes on"). If you can't see after scanning the area, use "no eyes", "no visual", or "negative contact" to communicate that to your lead and/or teammates.

ID Terminology:

Bogey/Contact - unidentified aircraft

Friendly - allied aircraft (positive ID)

Bandit - enemy aircraft (positive ID)

Blind - lost situational awareness, can't see friendlies or bandit(s)

Situation Report requests can be abbreviated to "SitRep".. Ex: "Gamertag, SitRep" When asked for a sitrep, respond with your location, altitude, what you're doing, and your fuel/ammo/damage status.

When operating above approximately **1000 meters (3,000 ft) AGL** in a 4-ship, assume if the flight lead calls a circle break that you are to perform the "**high altitude**" **circle break**, in which number 2 and 3 break left and right, respectively, and lead breaks low in a split S, number 4 following them down as a "tactical number 2". Anything below this altitude, assume a "low altitude" circle break, in which the flight lead and his wingman break left together, while number 3 and 4 break right together.



Group Tactics:

Most of the time while operating in the Area of Operation (AOO), an element or flight will be in some form of **combat spread**. Wingmen should **shackle** (reference page 12) all of their lead's turns larger than 30 degrees without requiring verbal instruction to do so, it should be **automatic**. Maintain proper spacing and communicate to your lead if you're cooking your engine trying to keep up, they will throttle back to accommodate you.

When in a division that has split up into two different elements, **call the merge** with bandits and ping location on the map for your teammates' situational awareness.. Ex: "*Name*, merging head-on with a bandit, this location" or "Flight #, head-on merge, enemy Spitfire, On me". As a general rule, it is helpful to develop the habit of pinging the "**Cover me!**" command whenever merging into a fight. Make sure you have the commands set up in the Controls menu.

Our **strength is in numbers**, and without a battle buddy, we leave ourselves exposed to enemy attacks. Lost pilots should immediately call that they are separated and **coordinate a rendezvous** at the first possible opportunity. Join another element temporarily or coordinate a safe RTB, or ask your leads what to do if unsure of what action to take. If separated, pilots cannot effectively maintain element integrity. They are to orbit in a safe area and altitude and notify the element lead/wingman that they are waiting to rejoin. Once any lead/flight recognizes the odds have shifted against them in battle, they need to **call an exit**, extension, or "bug-out" to disengage and reset their odds against the enemy.

Roles/Responsibilities:

A "**flight**" usually refers to a 4-ship (also referred to as a division) but is used to describe the whole force of pilots we are flying with at one time, while an "**element**" refers to each 2-ship coupling within the flight or division. Each flight contains elements with their own respective lead and wingman, while the lead of the primary element is considered "flight lead". The flight lead will usually be the highest ranking pilot in the group, and will take responsibility for the safety and effectiveness of the flight as a whole. Each element within a flight will consist of a **lead and a wingman**.

The role of the **lead** is to protect the integrity and safety of their wingman, while the wingman is focused on reciprocal protection of their lead. The leads will organize the tactics and formations to be flown to maximize the element's effectiveness, remaining within the tactical framework laid out by the flight lead.

As a **wingman**, you are focused on following the directions of your lead, providing suggestions and situational awareness, and protecting his six.

A good lead/wingman pairing will check across each other's six on average every **6-8 seconds** when operating in the AOO. This mutual support between lead and wingman is what gives strength to the integrity of an element. Leads should ALWAYS know where their wingman is, and wingmen should ALWAYS stick with their leads. Remember that oftentimes a flight will focus different elements on different targets/tactical objectives to better-distribute firepower and put pressure on opponents, so you will not always be within the safety of large flight numbers. If you lose contact with your lead or wingman, call for a **rejoin immediately**.

Tactical Lead "Tac Lead": Temporary hand-off of lead role to someone in flight who does not otherwise assume the role of lead. Used for different tactical purposes and verbally given back once done... Ex: "Flight #, taking Tac Lead to nose-point the enemy".

“**Guns solution**” is used when you are about to have a firing opportunity while flying tactical with one or more teammates. Ex: “Flight #, guns solution” then use “shots”, “guns” or “snapshot” when firing. Give update after snapshot if able... Ex: “Critical hit, continuing”.

“**Splash**” - air target kill... Ex: “splash bandit” or if multiple bandits, “splash two” (or # of however many are now dead).

“**Pickle**” - term for dropping a bomb or other unguided payload. Allows the rest of the flight to maintain safe frag distances from the target area and **coordinate the timing** of bomb drops. It can be helpful to immediately follow up with the **fuse time** on your payload for the pilots behind you when bombing in a trail formation... Ex: “Pickle, 5 second fuse”.

Radio/Comms Discipline:

Try to keep the radio transmissions brief and to-the-point. When we have an excessive rate of radio chatter on frequency, it becomes difficult to maintain proper communication, and important information may be lost. Flight and element leads should be given slight priority on comms to allow for flow of commands, formation changes, and tactics, however any pilot on comms should feel free to make suggestions, call contacts/bogeys, and most importantly, ask for help when they need it.

“**Clear Comms**” should be used by leads or wingmen when there is excessive radio chatter and something important needs to be said that is time or safety-sensitive. When you hear the phrase, stop broadcasting and listen for the info.

When in combat, the **engagement at hand always takes priority**. If your neighboring element is in a fight while you and your wingman are not, allow for extra room on the radios for them to handle it.

The **NATO phonetic alphabet** is utilized to describe the rows on the tactical map (among other things). Use the code for the row coupled with the number of the column on the tactical map to describe locations on the tactical map grid. For increased precision, use the phrase “**zone**” followed by the number associated with the 3-by-3 grid of an old cell phone or telephone keypad to further micro-locate positions WITHIN a single grid-square on the tactical map... Ex: “Enemy bombers high altitude, Echo Three, zone 6”.

The NATO phonetic alphabet is:

Alpha, Bravo, Charlie, Delta, Echo, Foxtrot, Golf, Hotel, India, Juliet, Kilo, Lima, Mike, November, Oscar, Papa, Quebec, Romeo, Sierra, Tango, Uniform, Victor, Whiskey, X-ray, Yankee, and Zulu.

“**Anchoring**” refers to orbiting in one spot for some tactical purpose.. Ex: “Gamertag, anchor the ground target in Bravo 4” Orbiting refers to a wide-radius, continuous turn.

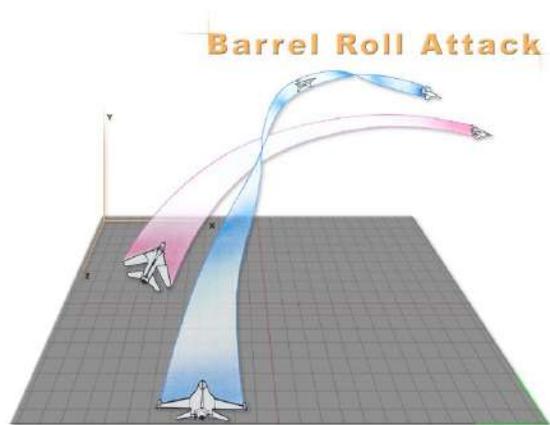
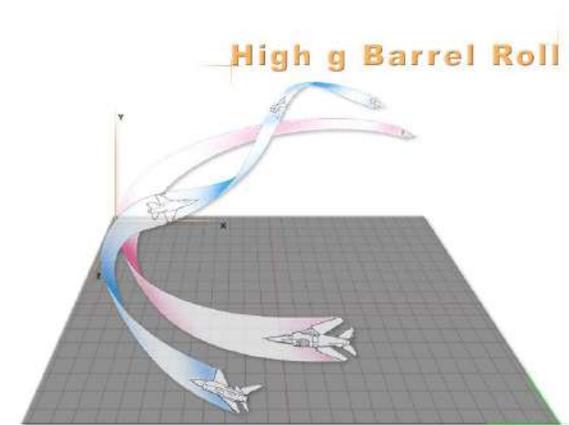
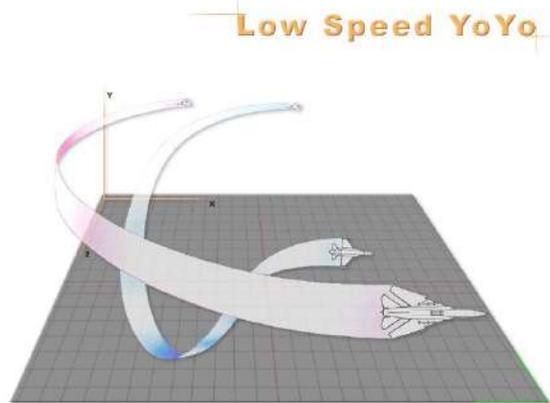
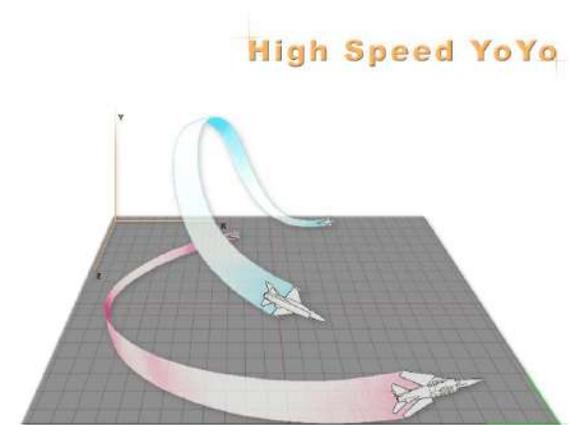
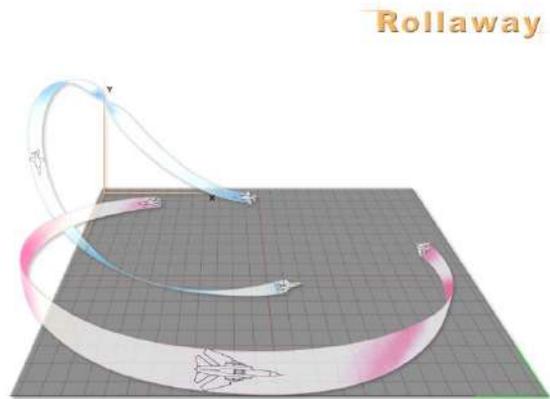
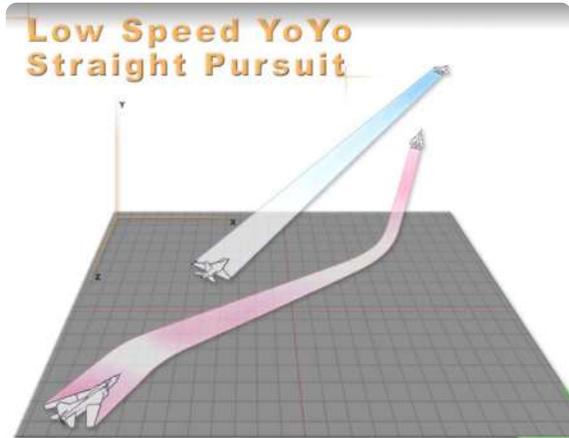
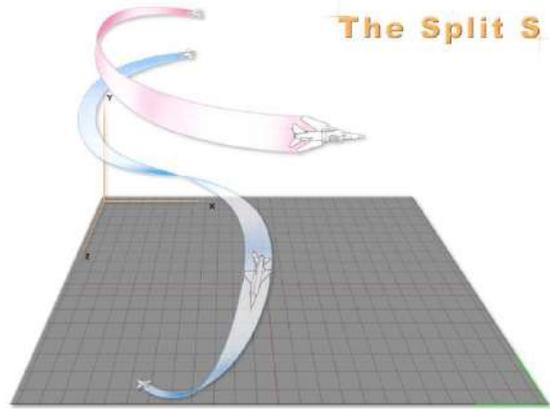
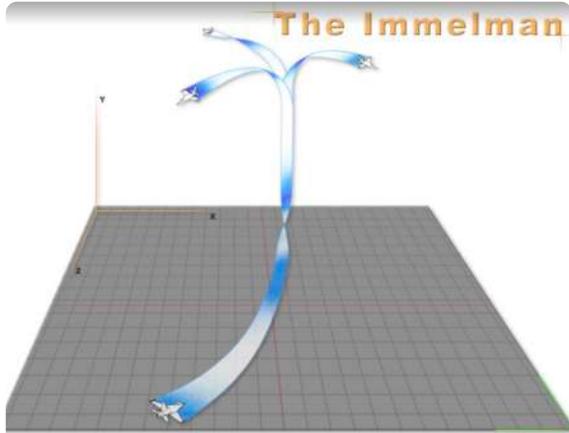
“RTB” stands for **Return To Base**, use your best judgement for when it's time to head back (tip: pulling back the throttle to 65% or so can drastically increase your remaining air-time while still maintaining controlled flight when caught low on fuel and away from an airfield).

“**Bingo fuel**” is used to tell teammates you’ve hit the minimum fuel needed to safely RTB... Ex: “Flight lead, two’s Bingo fuel”.

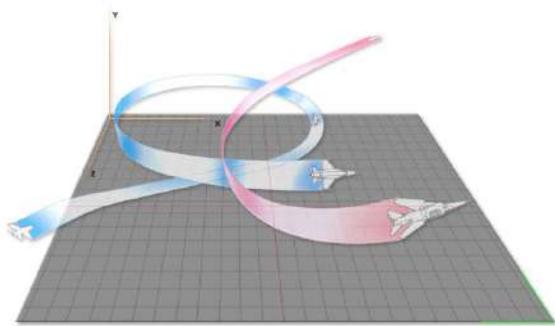
“**Winchester**” - Indicating a low or empty ammo load, usually requiring a RTB.



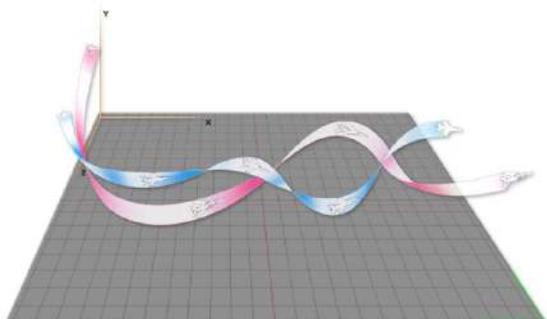
1v1 BFM Tactics/Maneuvers:



Offset Head On Pass



The Scissors



Vertical Rolling Scissors

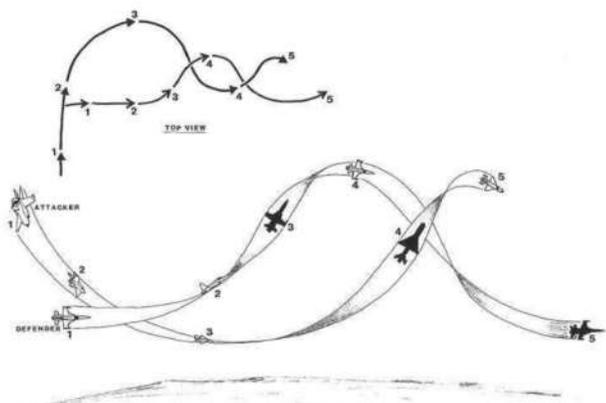
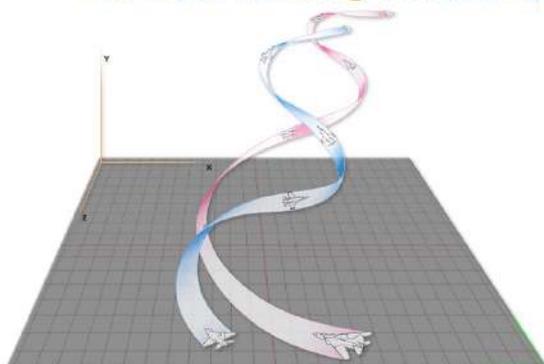


Figure 2-20. Rolling Scissors

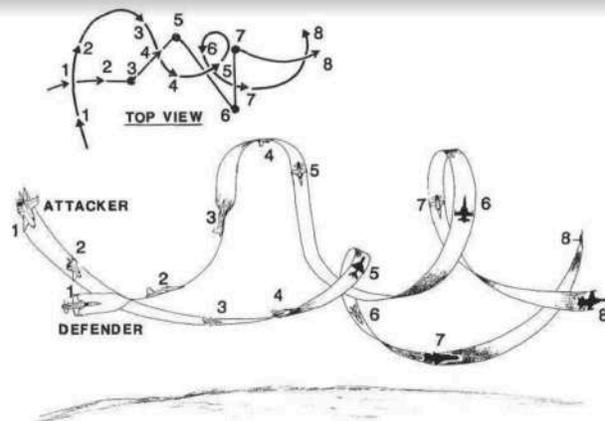


Figure 2-21. Rolling-Scissors Technique

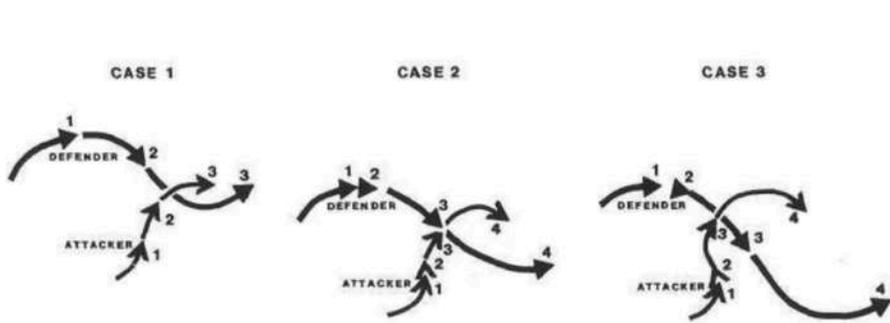


Figure 2-17. Effects of Reversal Timing

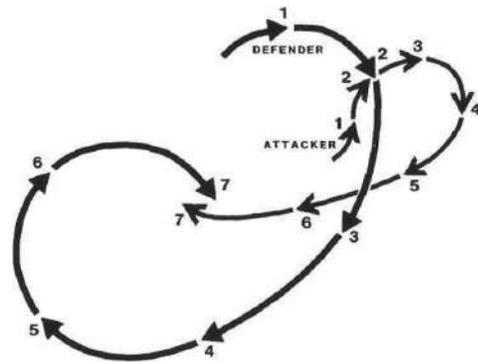
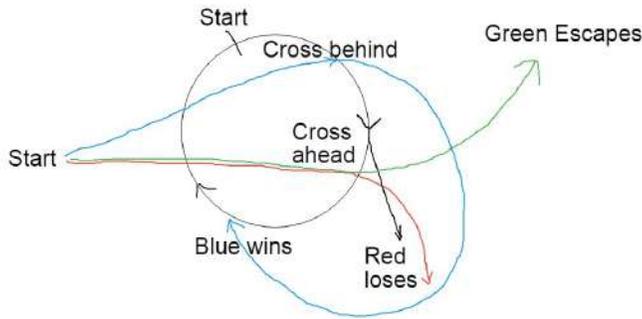


Figure 2-18. Disengaging from a Flat Scissors

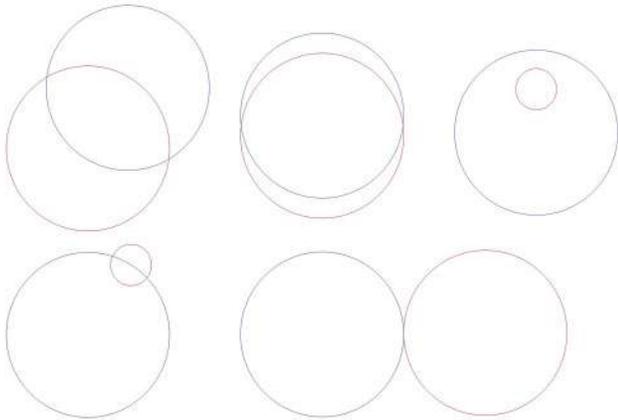


Red Green and Blue are all trying to engage Black.
 Black moves slower than the others.
 Blue uses lag pursuit to get behind Black.
 Green uses lead pursuit to get a shot on Black and then reverses his turn to escape.
 Red uses lead pursuit to get a shot on Black, does not reverse his turn and is pushed out in front of Black.
 If Black mistimes Red's overshoot, or Red is able to pull an insane amount of G, they could end up in flat scissors.



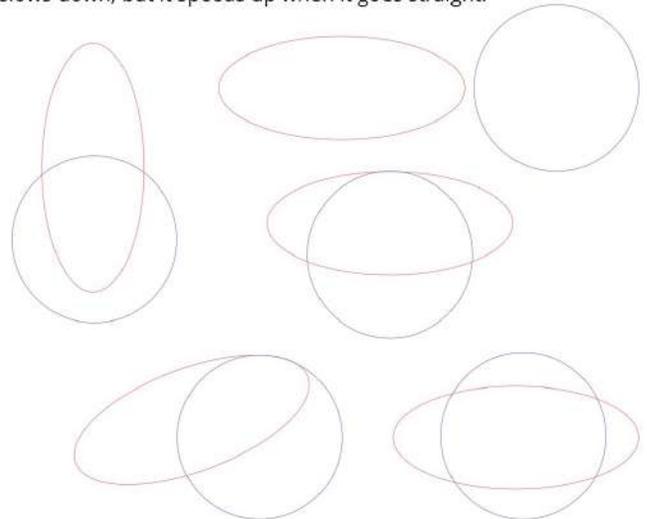
Exercise 1

The red and blue circles represent the paths of two different planes. Both planes can do a full circle in the same amount of time. Trace around both circles at the same time in the same and different directions with two rulers / pencils / chopsticks and work out in which situations one plane can shoot the other. Then imagine what it would look like to fly these circles from a pilot's view.



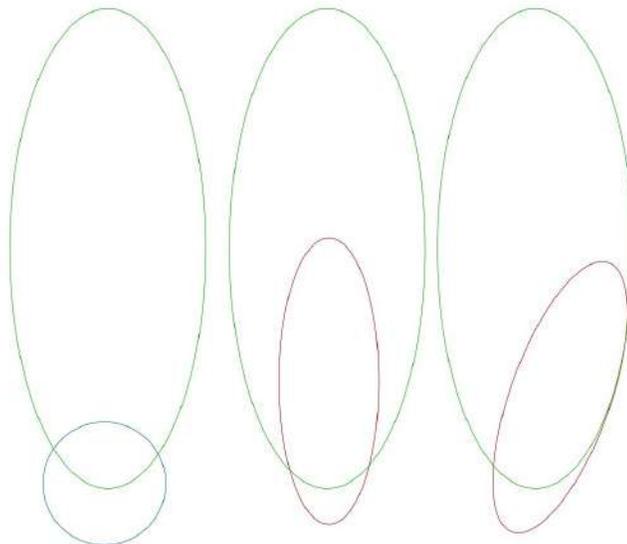
Exercise 2

Same as Exercise 1. Trace around both lines in a variety of positions and directions to work out the positions where the planes can shoot each other. Also remember that when a plane turns tighter it slows down, but it speeds up when it goes straight.

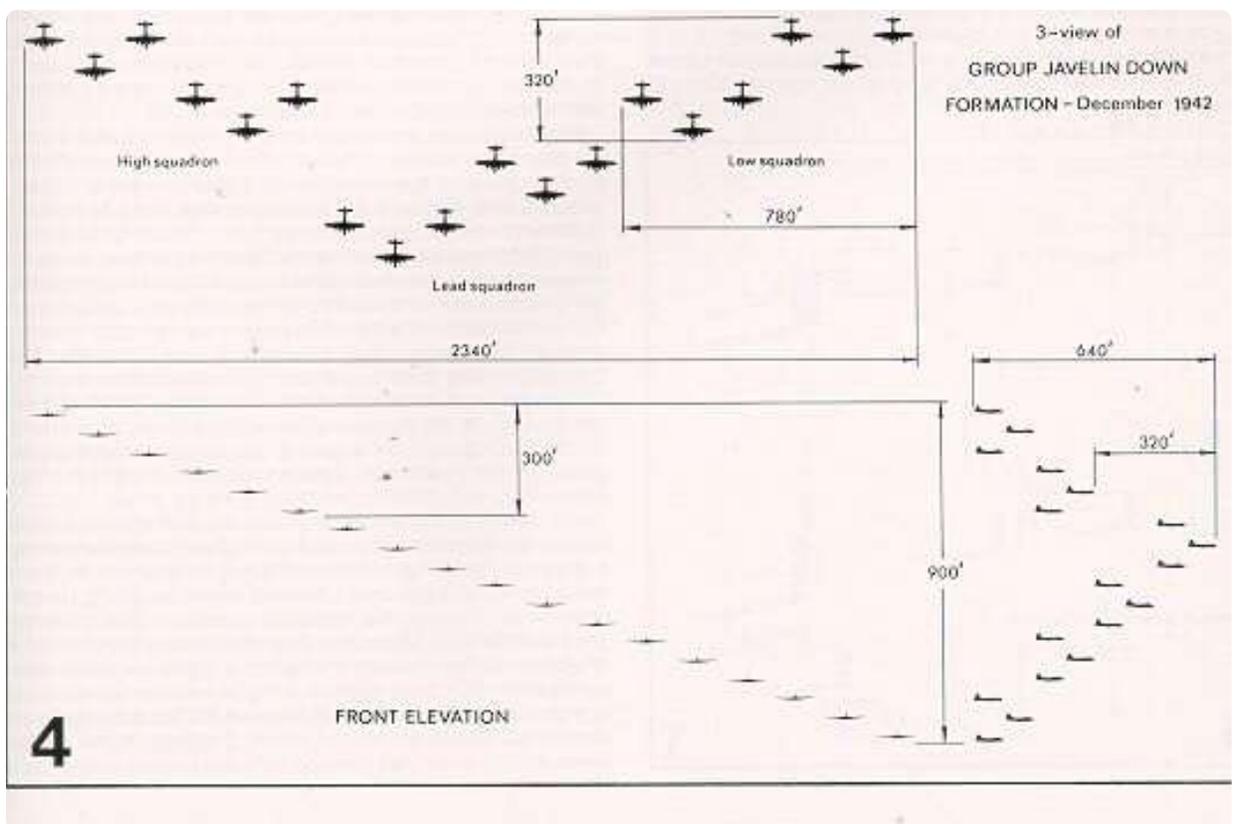
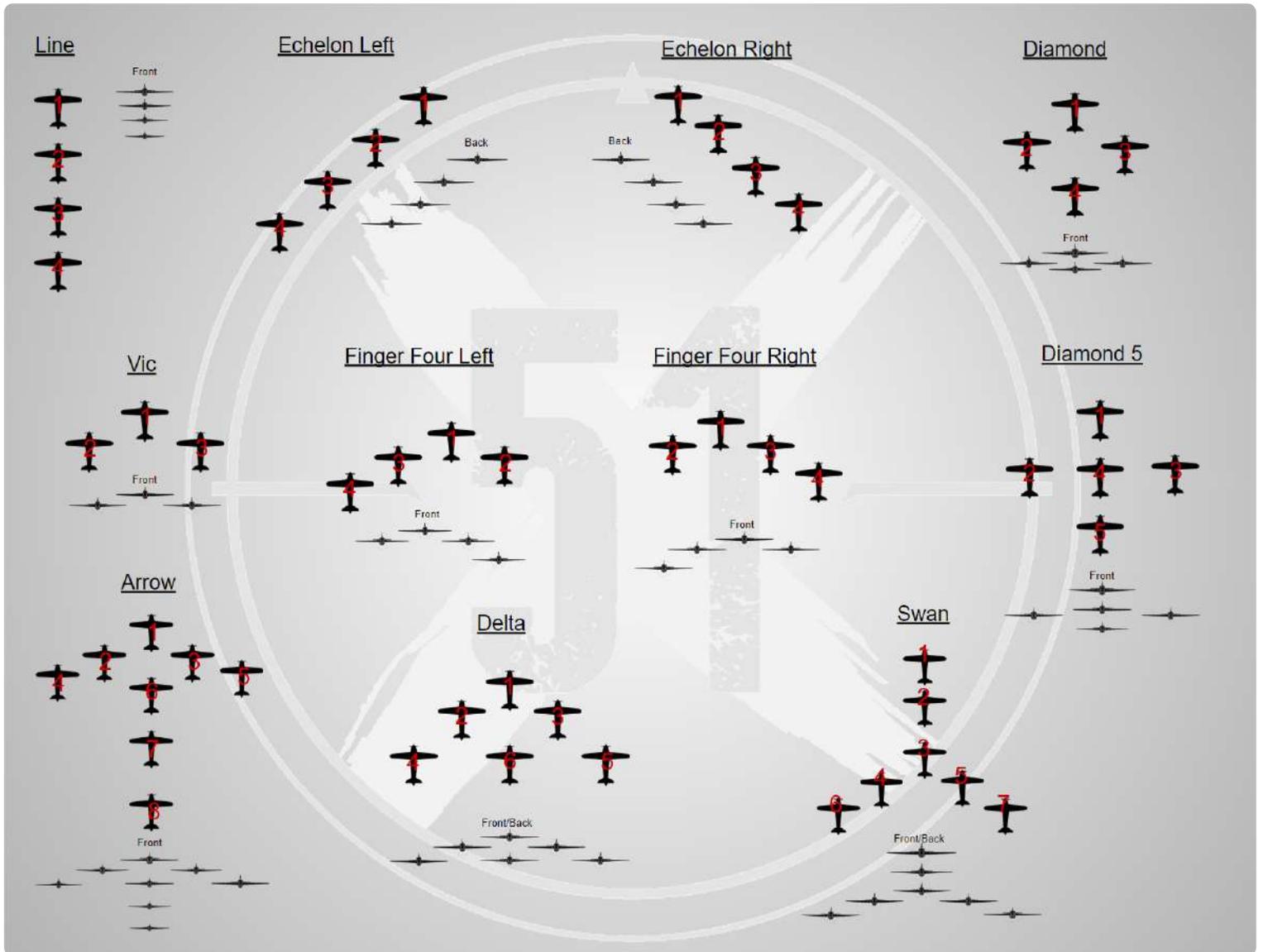


Excercise 3

Hint: think vertical...



Formations:



order. There will be times, such as hard turns, when only NEAR ROCKS can be cross-checked. The key is to quickly re-establish the cross-check one sector at a time as tasks permit.

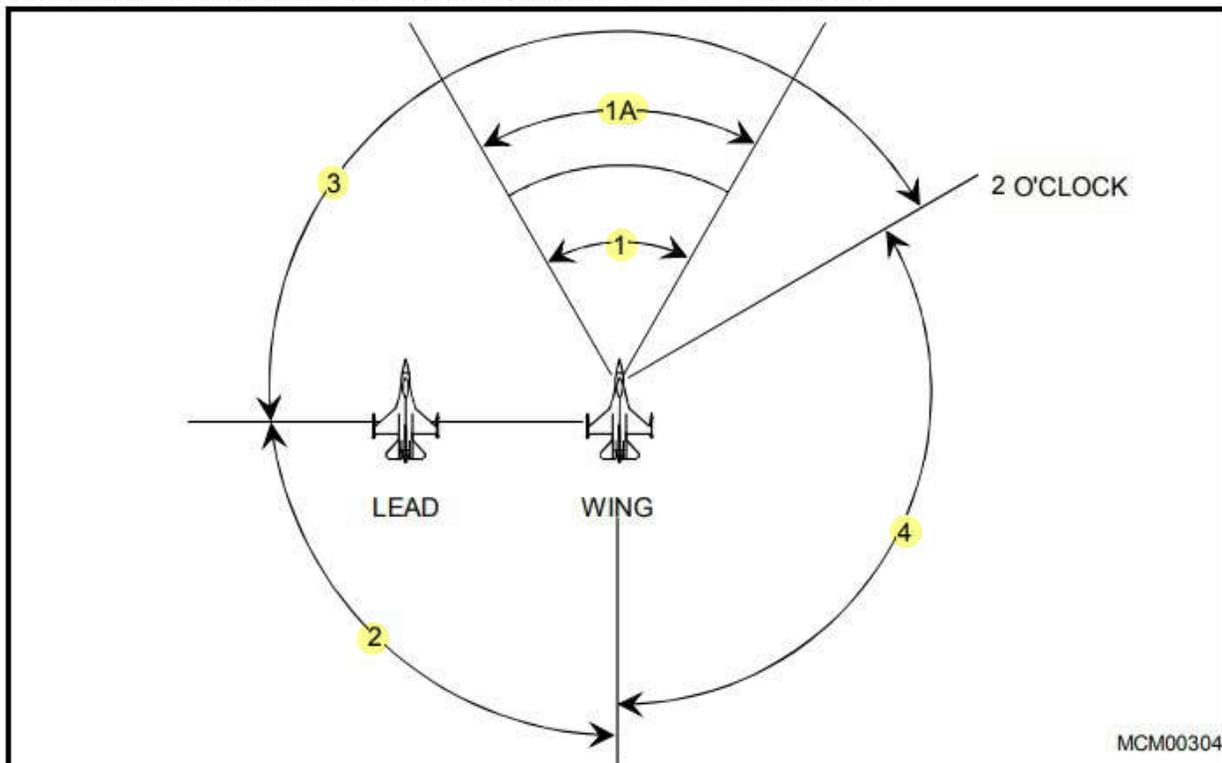


Figure 3.4 Lookout Responsibilities

Although the pilot has a myriad of responsibilities, he can only perform one task at a time. Therefore, he must employ a time sharing plan to quickly and efficiently accomplish many tasks. The following is an example of a time share plan for lookout responsibilities. The airspace around the aircraft is divided into sectors and each sector is assigned a priority based on lookout responsibilities (Figure 3.4). This plan is developed from a perspective of number two in a four-ship, but the principles apply to all positions in the flight.

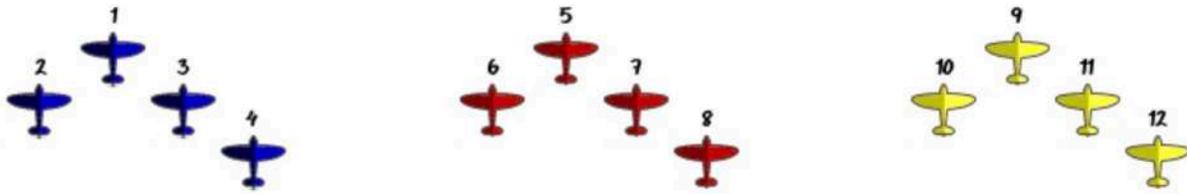
Sector 1: This is the hub of the cross-check. It is divided into two parts. Sector 1 is NEAR ROCKS, the rocks that will affect your flight path in the next 10 to 15 seconds. This sector is the highest priority sector and is the center of the cross-check. NEAR ROCKS are the ones that present an immediate threat. Sector 1A is FAR ROCKS, the terrain that will affect our future maneuvering. Pilots that look ahead at the FAR ROCKS are smooth in their maneuvering to maintain position or navigate because they see the mountain peaks and valleys in time to make small corrections.

Sector 2: Besides avoiding the ground, the next most important area for lookout space is inside the flight's six o'clock. Sector 2 allows number two to monitor his formation position and check lead's six o'clock. Sectors 1, 1A and 2 make up the basic cross-check—NEAR ROCKS, FAR ROCKS, CHECK SIX.

Sector 3: Once these responsibilities are completed, other areas can be brought into the cross-check. The next sector is inside the flight ahead of the 3/9 line. Searching this area can detect bandits in a conversion, as well as SAMs that may be fired from the front quadrant. Sector 3 is lower priority than Sectors 1, 1A and 2; therefore, it should be searched less frequently. NEAR ROCKS and FAR ROCKS must be checked during each search cycle. The frequency of search is dependent on pilot task saturation.

Sector 4: When proficient enough, expand the search to a 360° lookout by picking up Sector 4. Sector 4 is outside the flight, ahead/behind the 3/9 line. This sector is the lowest priority—the wingman owes it to his flight lead to provide inside the flight lookout before dedicating time to this sector.

Finger-four squadron formation

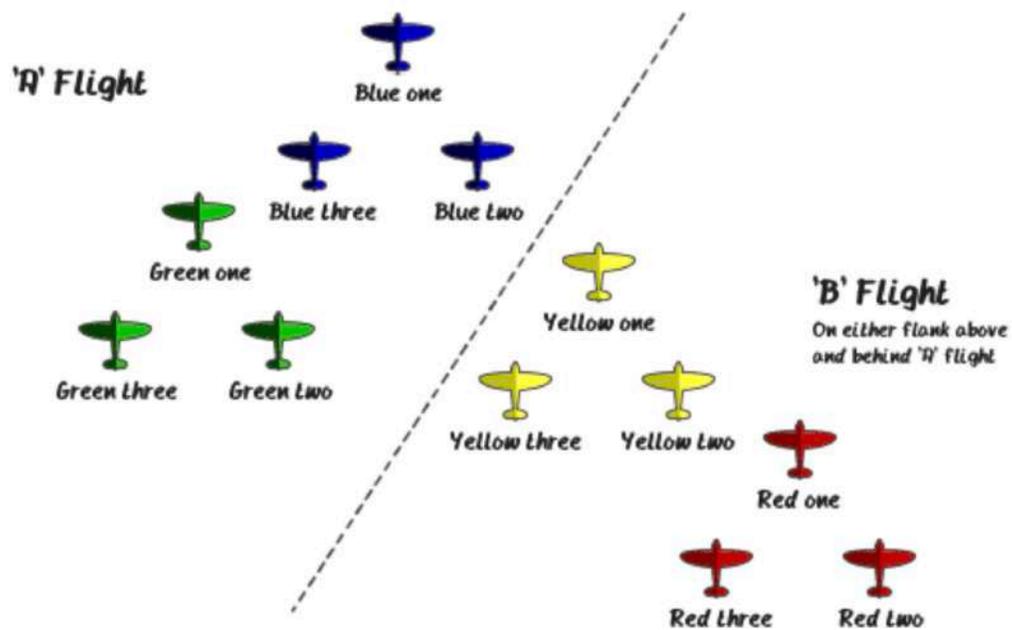


- 1. Offence
- 2. Defence
- 3. Offence
- 4. Defence

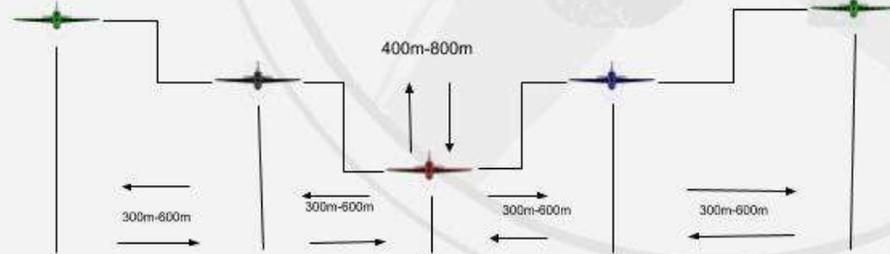
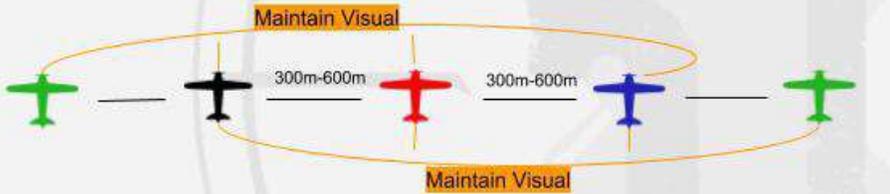
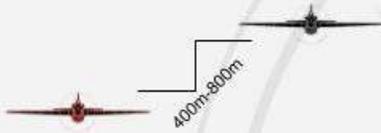
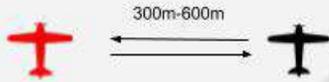
- 5. Squadron leader
- 6. Lead wingman
- 7. Element lead
- 8. Element wingman

- 9. Flight leader
- 10. Lead wingman
- 11. Element lead
- 12. Element wingman

Squadron formation



Line Abeam or "Abeam formation"



Combat Spread

Elements fly line abeam - wing tips aligned across the aircrafts' beams, with a spacing of between 300 and 600m. This allows maneuver such as the sandwich or bracket pincer to be performed, gives enough spacing for elements to react to surprise attacks and increases visibility of the flight's rear quadrant.

The line abeam formation is suitable for Combat Air Patrol. Ideally performed in two-ships or a four-ship behaving as two independent units of lead + lead wingman and element + element wingman.

RED = Lead.
BLACK = Wingman
BLUE + GREEN = Second Element

Elements remain abreast but the wingman climbs 400m-600m to ensure an altitude advantage to cover lead

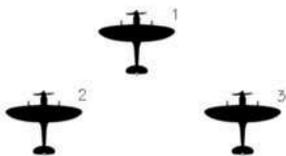
Maintaining separation distance is crucial to ensure all elements can react effectively in a dynamic situation. The large separations also allow for a wide field of view to monitor the lead's six.

Outer elements should be able to maintain visual of the wingmen on the other side of lead

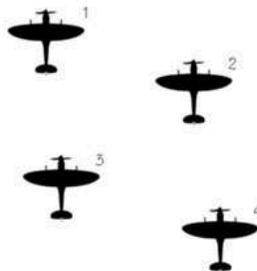
Turns are performed as cross-overs, with inside elements of the turn waiting for the outer elements to cross the wingline



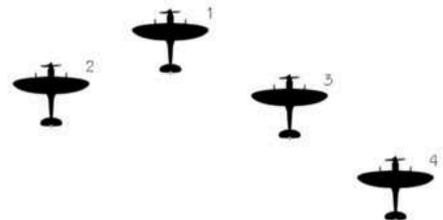
AIR COMBAT FORMATION



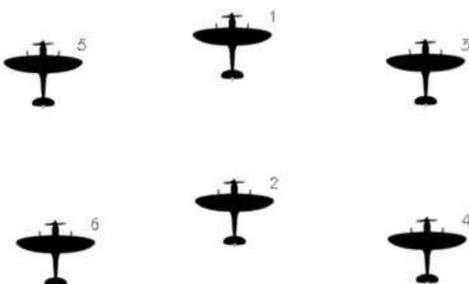
Vic Formation



Four-Ship Wall Formation



Finger Four Formation



Fluid Six Formation



Tactical (Tac) Turn

This maneuver allows a flight to turn 90 degrees in either direction while maintaining formation and distances while in combat spread. The outside element initiates the turn, with the next furthers out beginning the turn just before the turning element crosses their tail. This continues from outside to inside element until all have turned. The formation positions have now been reversed, but the structure and distance is preserved.

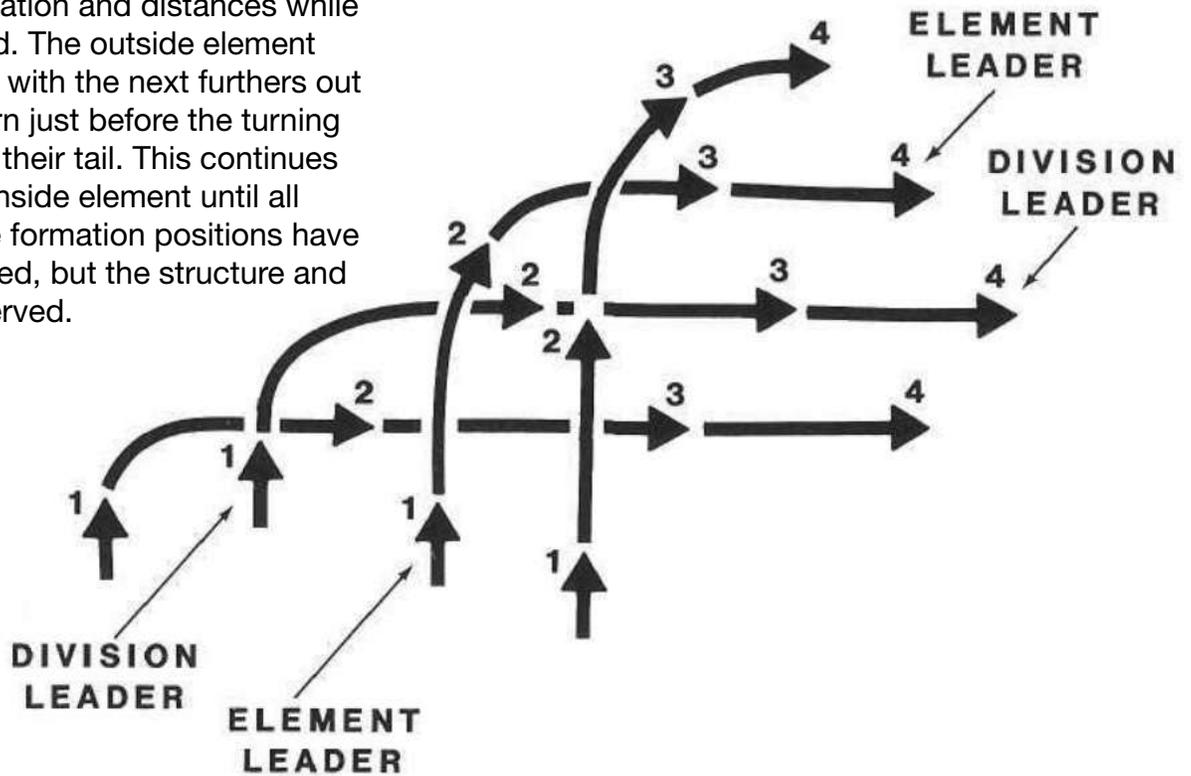
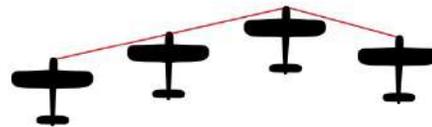
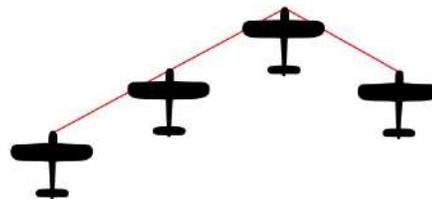


Figure 7-5. Division Tac Turn

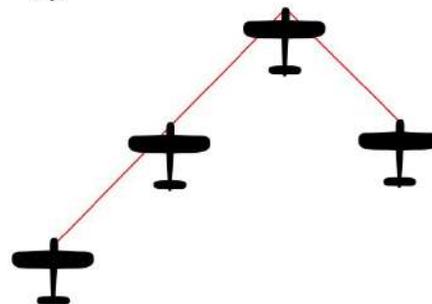
Acute



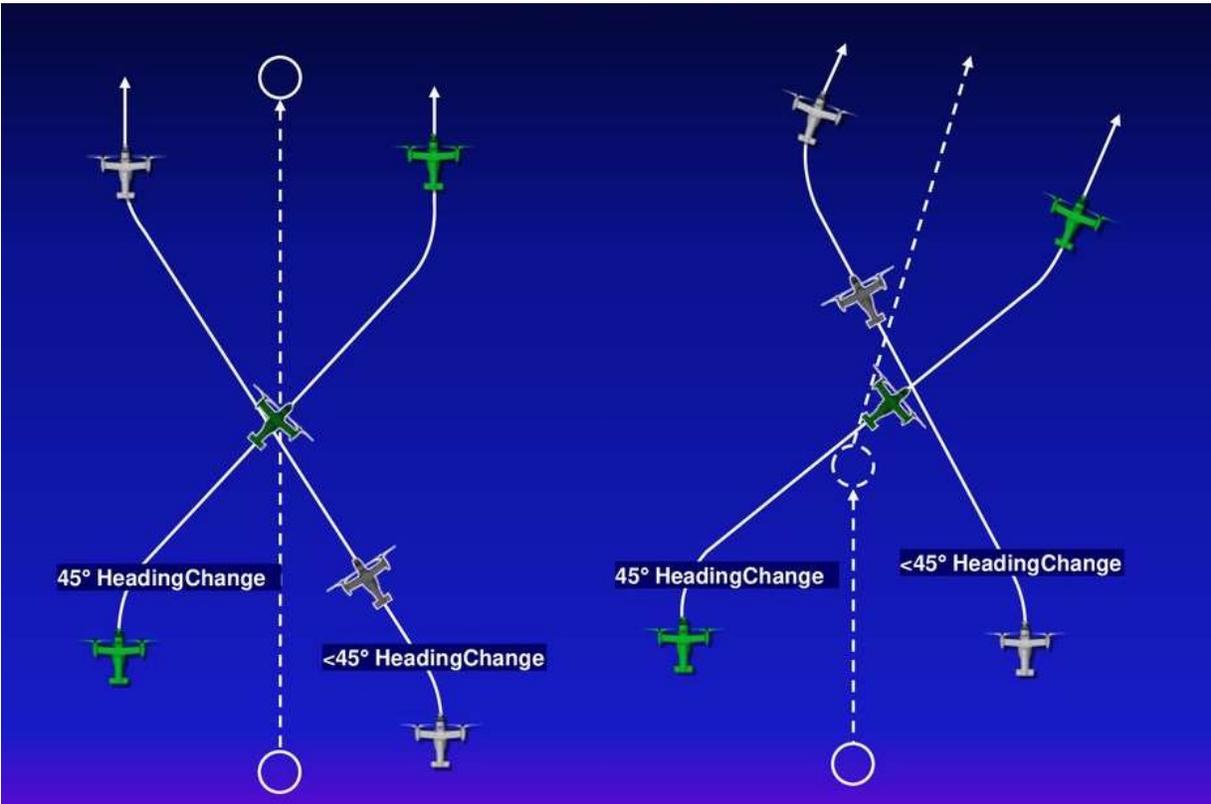
Ideal



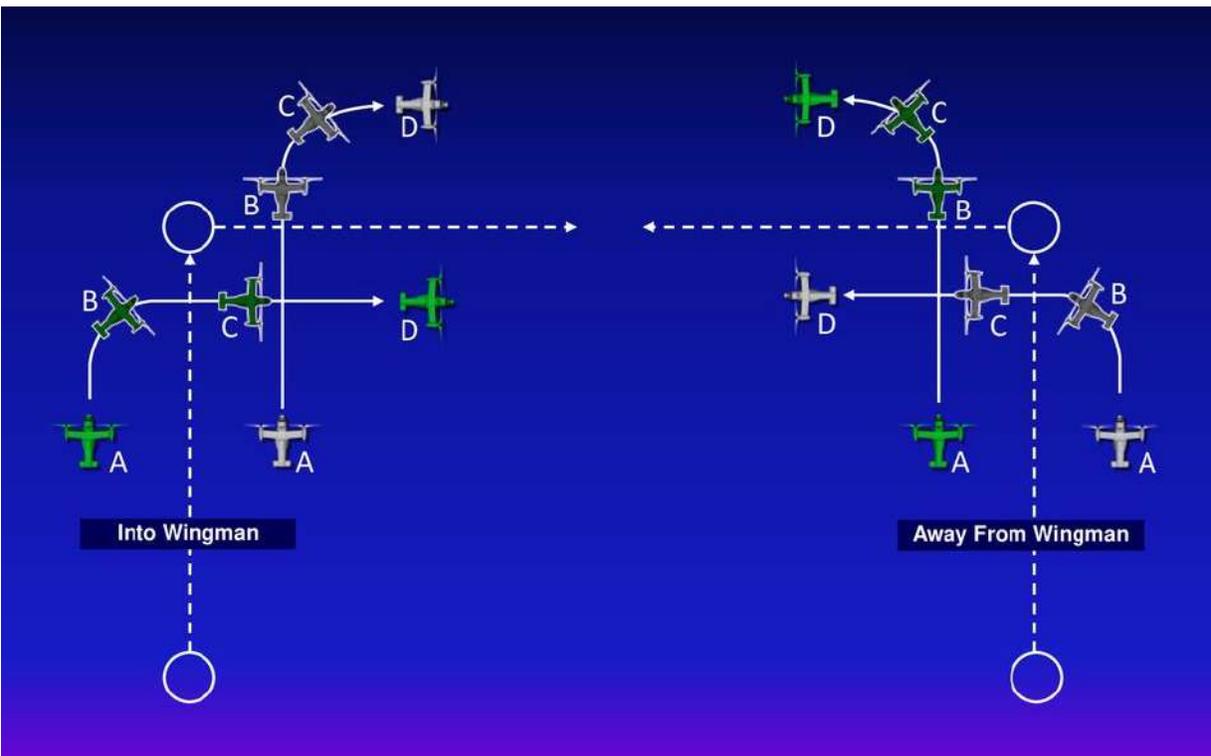
Sucked



Example of Shackle <90 degrees

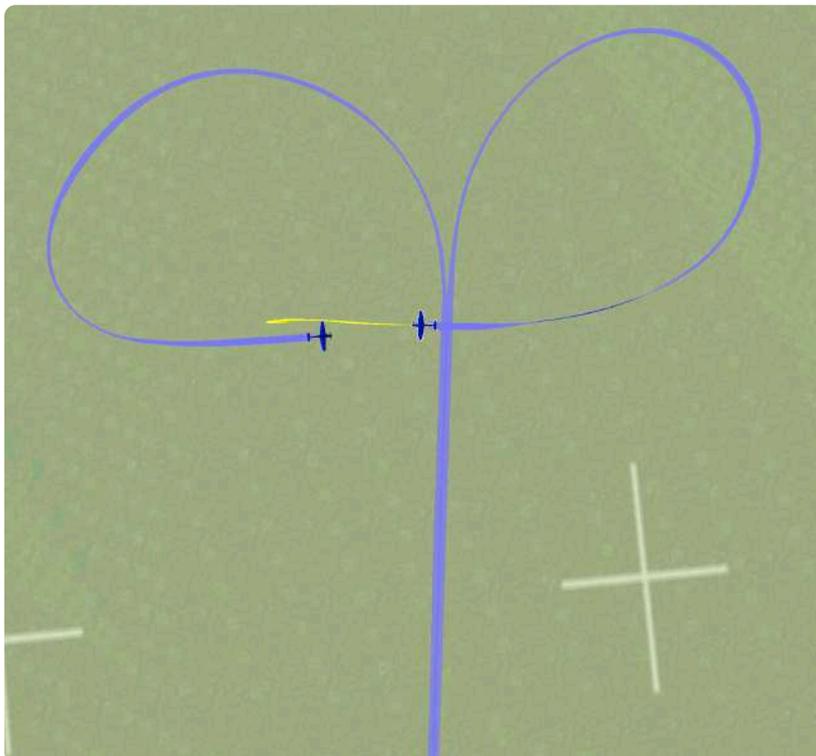
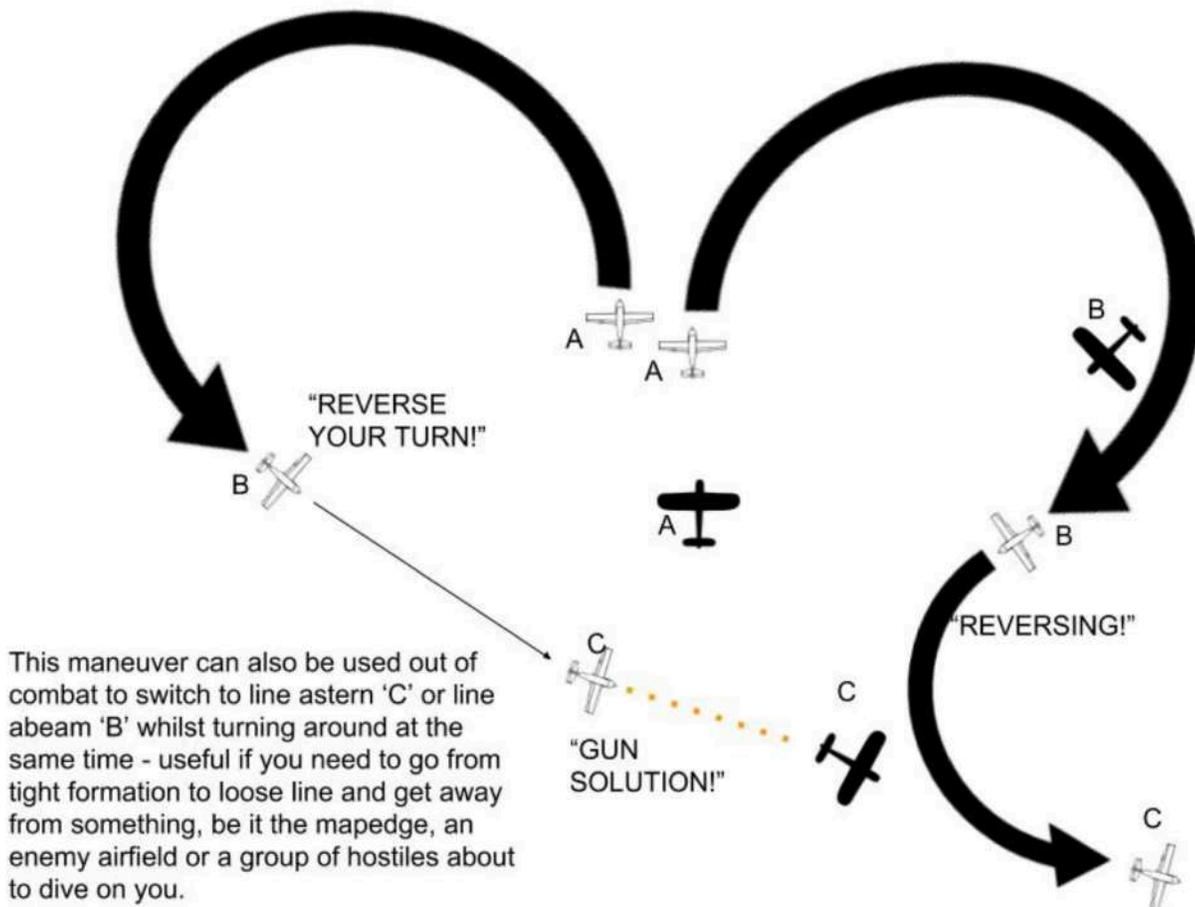


Shackle (Tac Turn) 90 degrees



Squad BFM Tactics/Maneuvers:

CIRCLE BREAK! (TO LINE ASTERN)



Circle Break

With a far attacker on the defending element's six, the element performs a circle break, turning in opposite directions in a level turn, forcing the attacker to choose one defender to attack. The free defender can now maneuver onto the six of the attacker, often by calling the engaged defender to reverse their turn around 180 degrees through the break.

In a flight of 3 or more, one element can perform a split-S maneuver and perform the same break but in the vertical.



Defensive Split

In a two-ship of defenders being attacked from behind, the defenders can perform a break in which both defenders turn in the same direction, but one defender extends slightly and climbs, while the other enters a shallow dive.

If the attacker chooses the low defender, the high defender can perform a roll and dive onto the attacker, in what is essentially the last half of a high yo-yo.

If the attacker chooses the high defender, the low defender can perform a barrel roll or the last half of a low yo-yo, while the high defender rolls into a dive, bringing the attacker down across the nose of the low defender.

Defensive Split

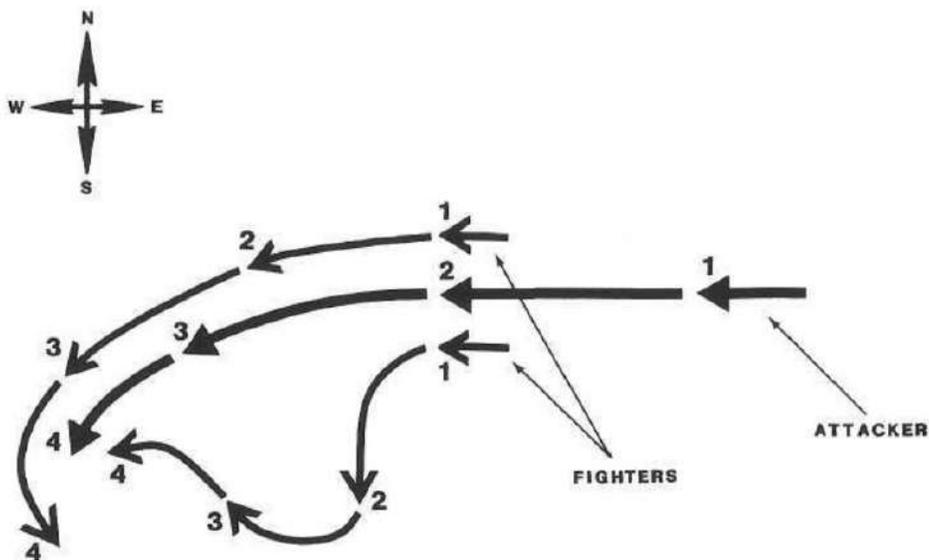
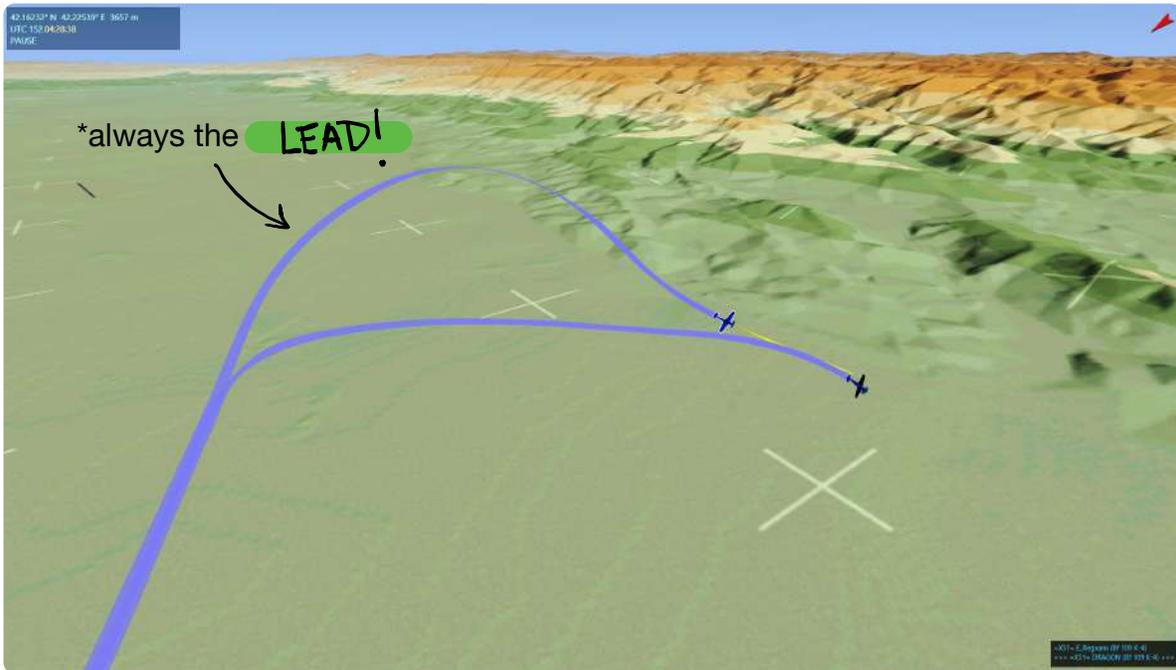
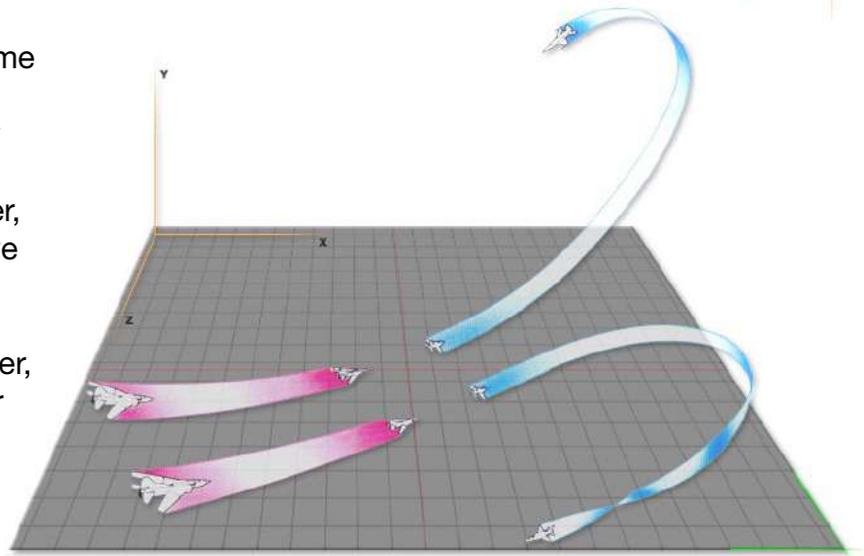
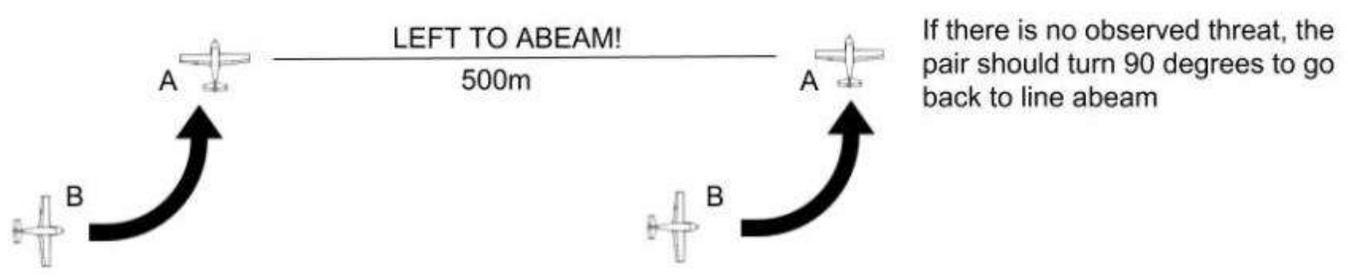
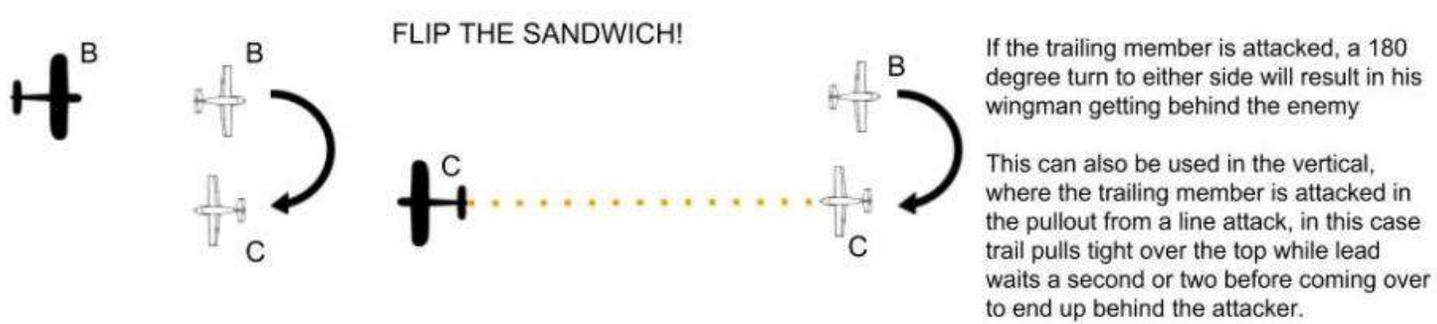
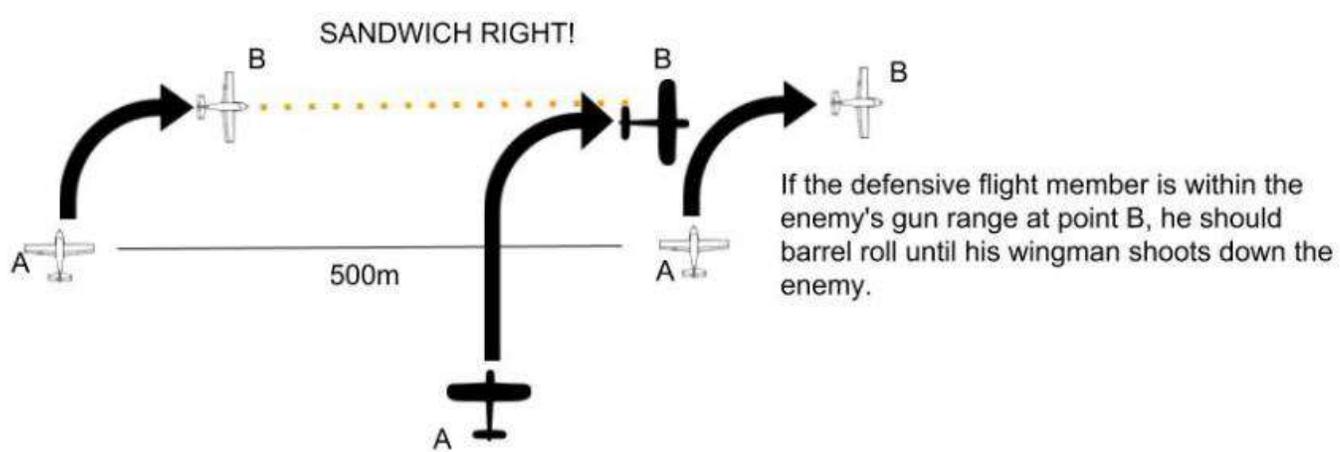
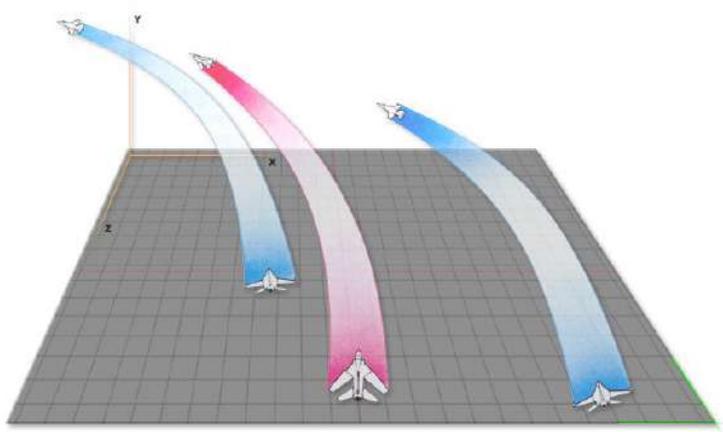


Figure 5-7. The Half-Split (Bogey Attacks Extending Fighter)



The Sandwich



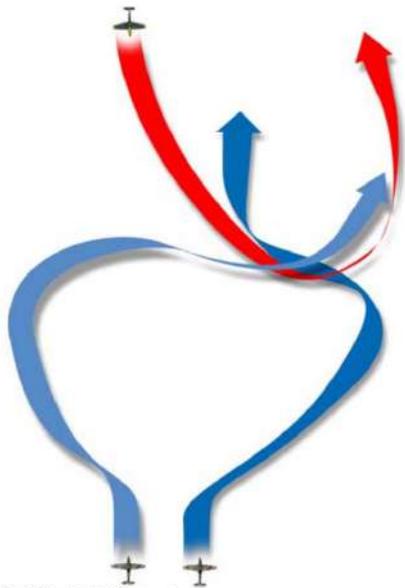
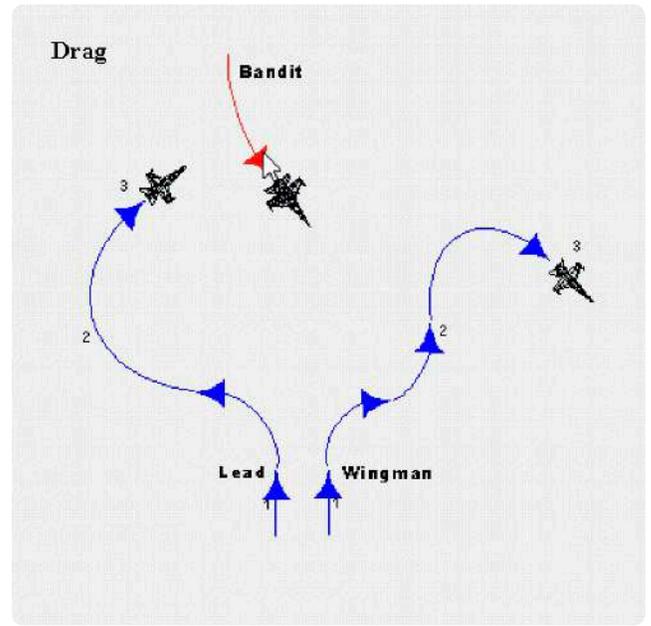
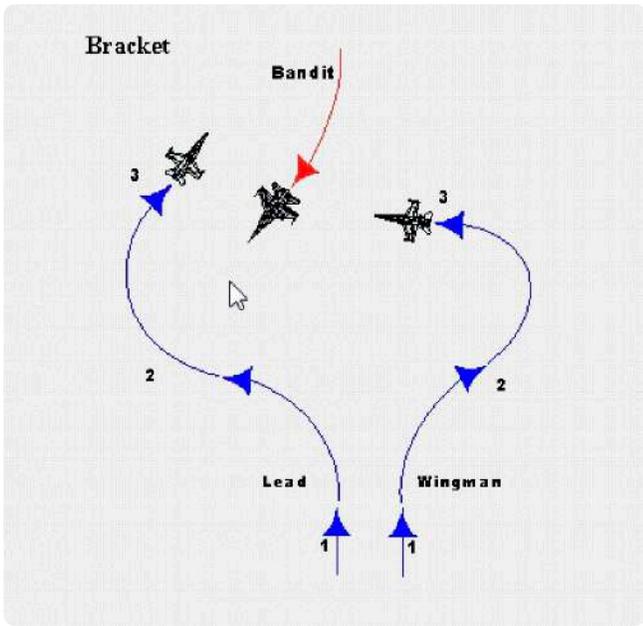


Fig 46. Bracket attack: 2 versus 1

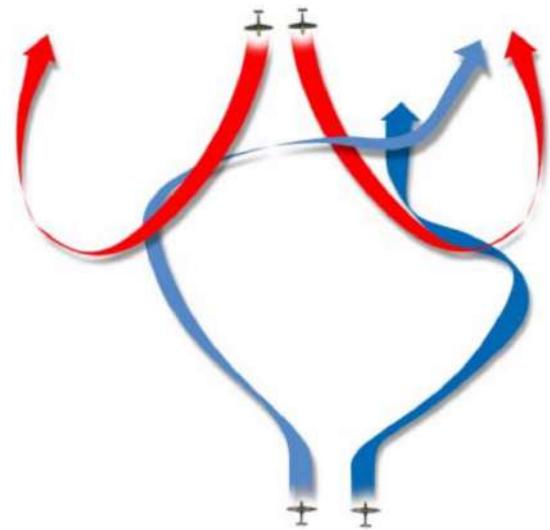


Fig 47. Bracket attack: 2 versus 2

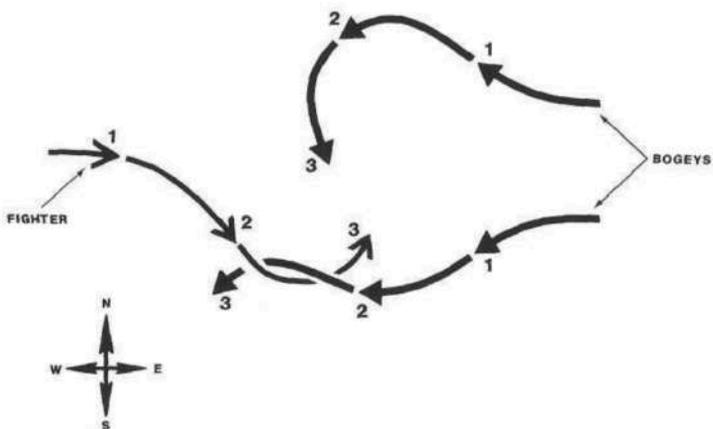


Figure 5-14. Defending against a Bracket: Case 1

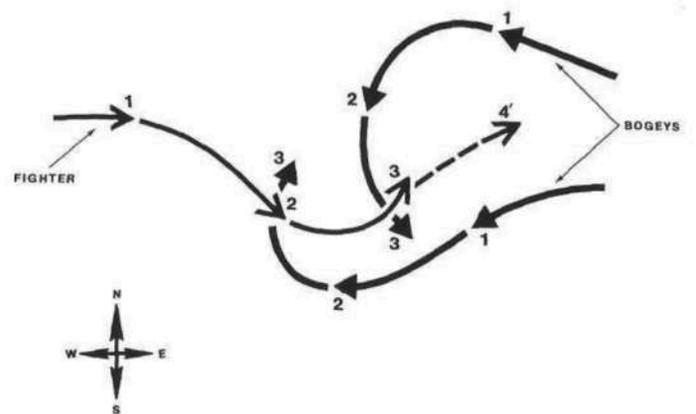
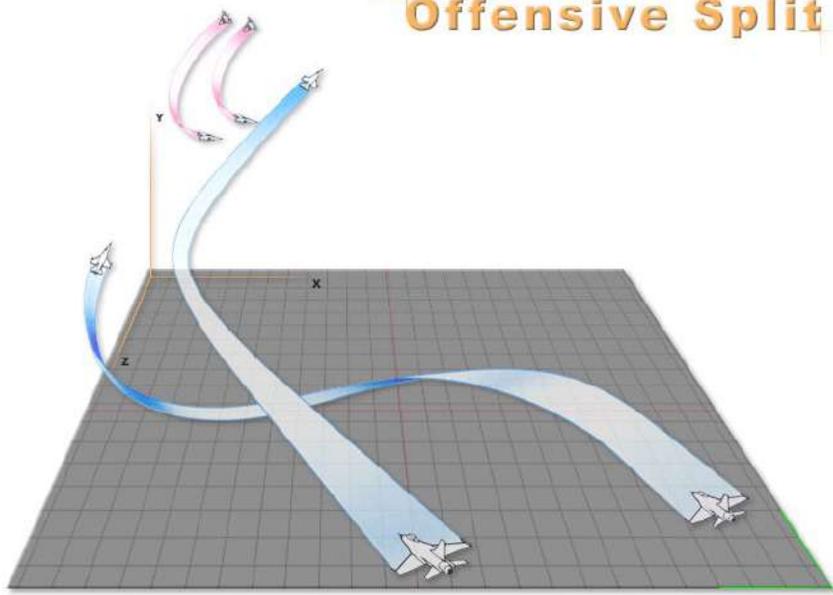


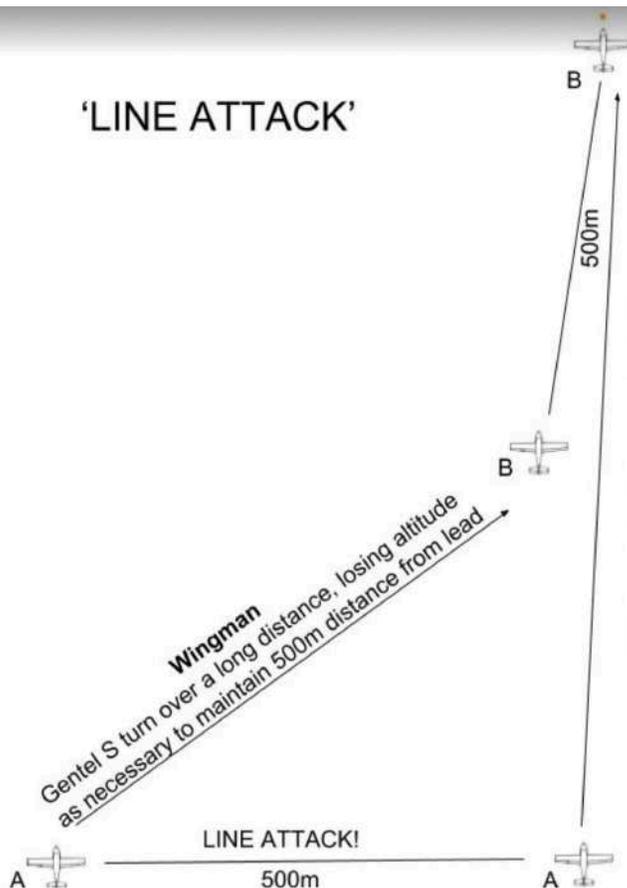
Figure 5-15. Defending against a Bracket: Case 2



Offensive Split



'LINE ATTACK'



Lead

Turn towards the target, if time permits slow down to let your wingman catch up.

However, remember that the risks of having your wingman falling back an extra 150m may be outweighed by attacking with the element of surprise. Also your wingman will be able to cut the corner to join up with you when you pull up after attacking. However, if he is far behind you will be less able to protect him, so make the choice you see fit for the tactical situation.



