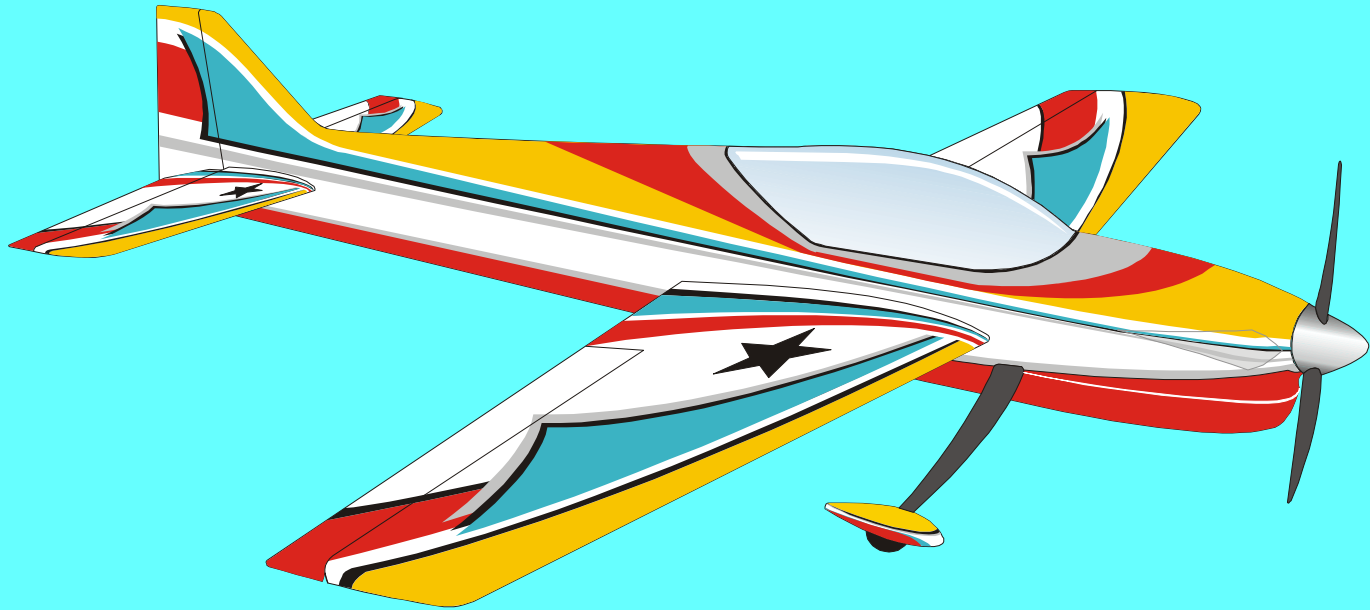
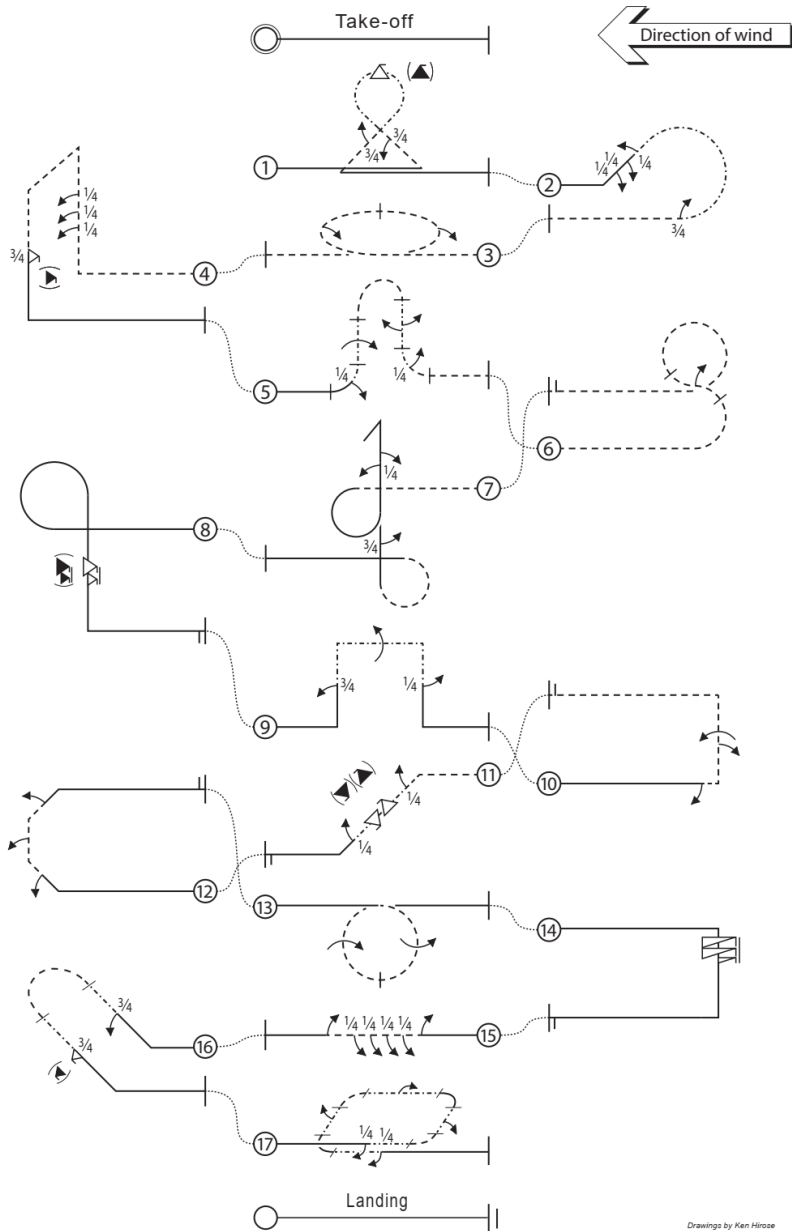


Flying and Judging F3A

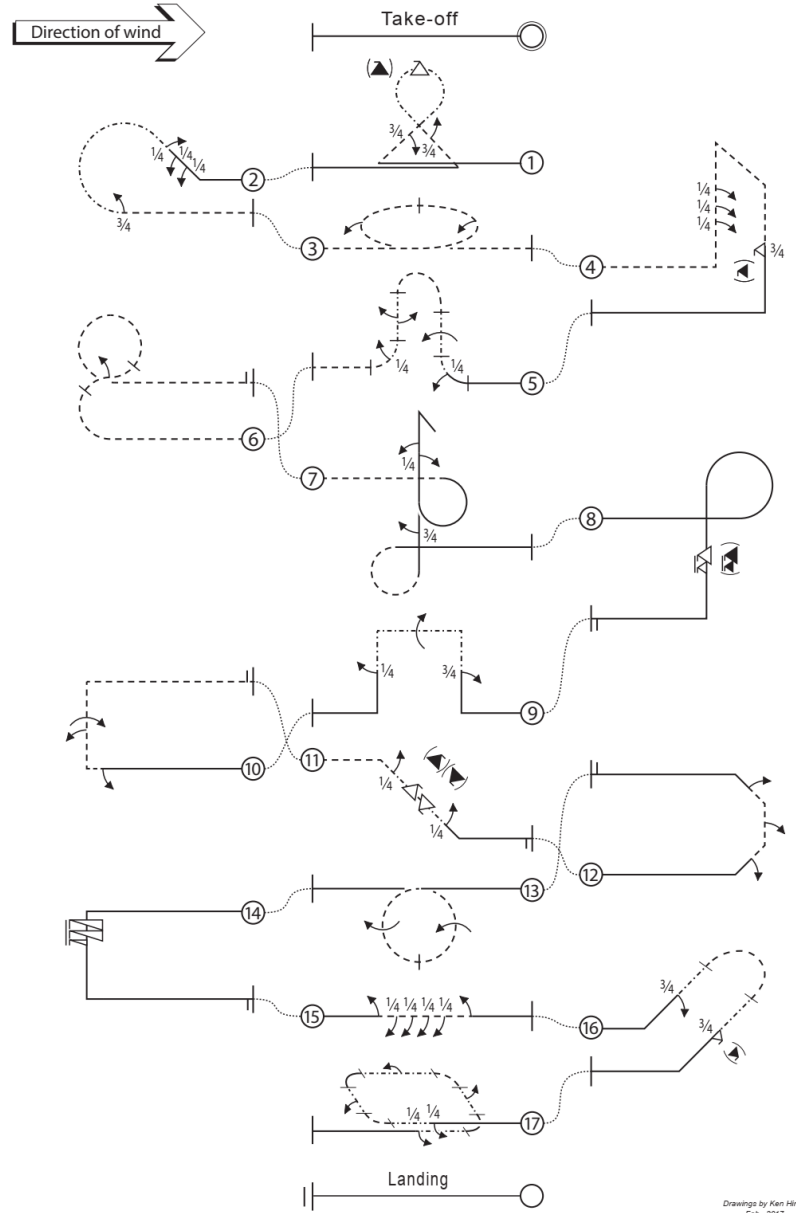


SCHEMATIC MANOEUVRE ILLUSTRATIONS
SCHEDULE F-21

FINAL SCHEDULE F-21 (2020-2021)

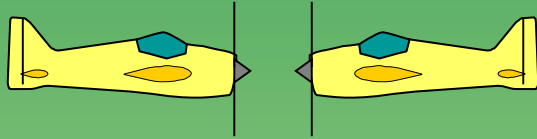


FINAL SCHEDULE F-21 (2020-2021)

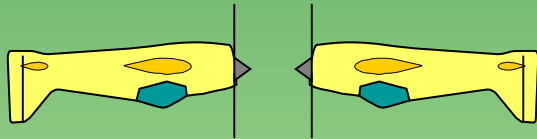




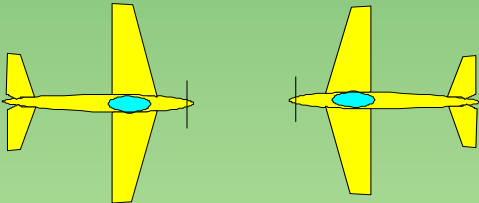
Explanations:



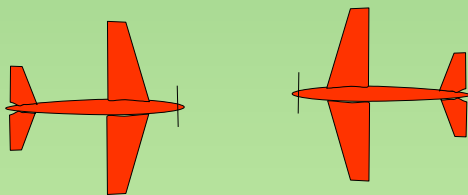
Aircraft upright



Aircraft inverted



**Aircraft in Knife-Edge
View from Top**

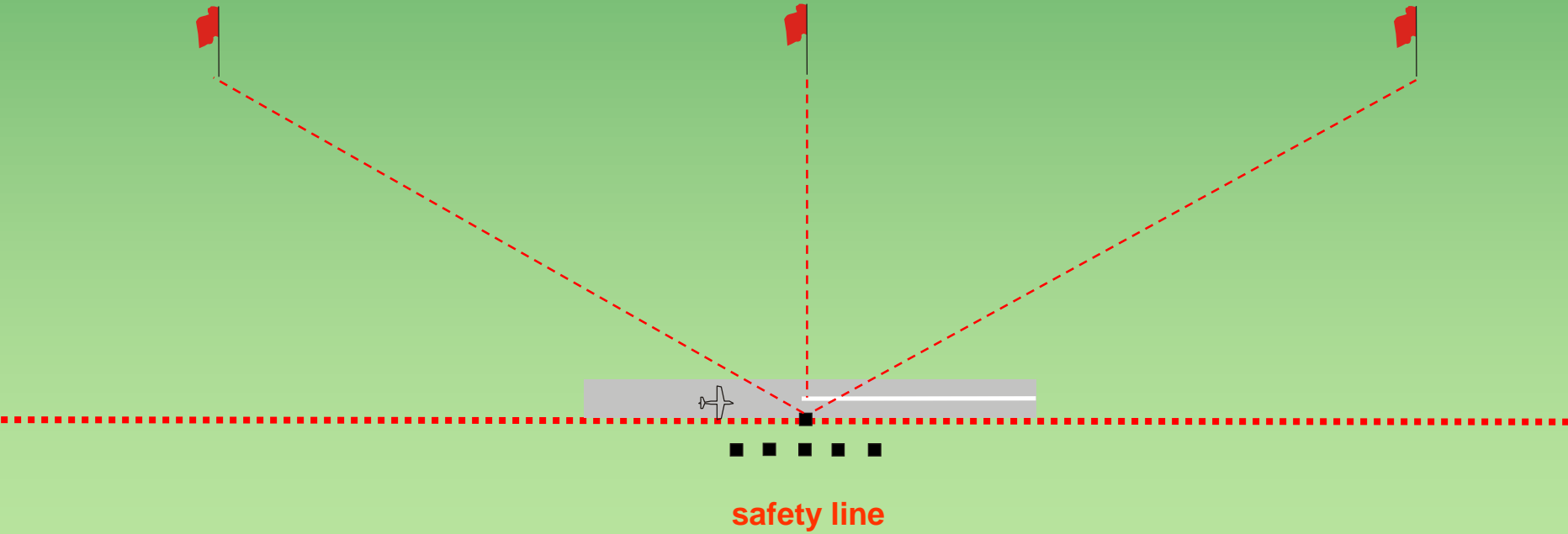


**Aircraft in Knife-Edge
View from Below**



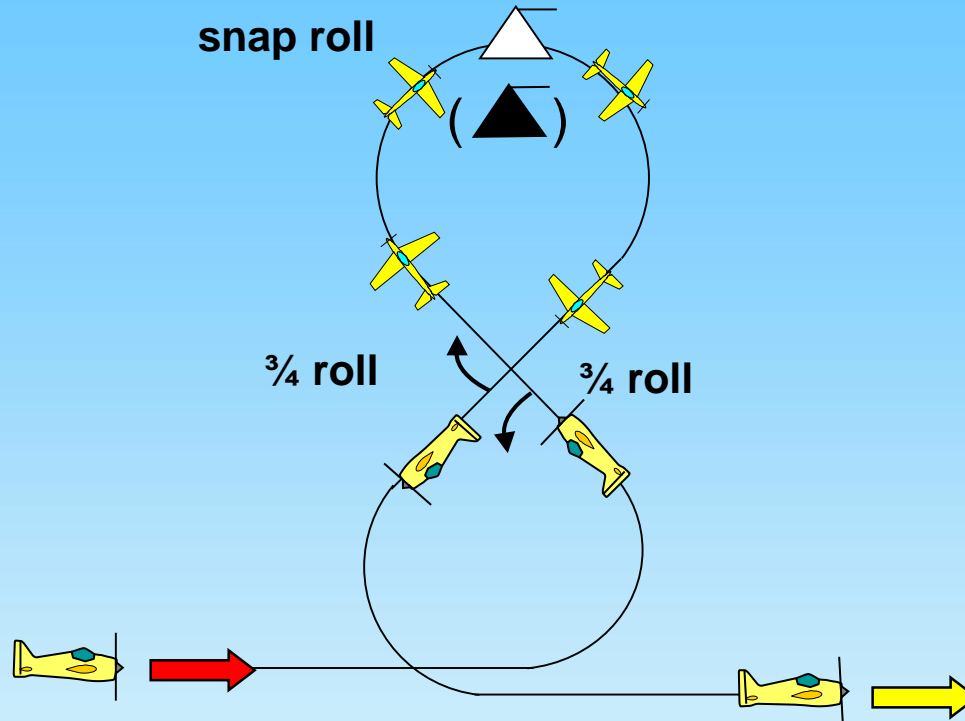
Take-off procedure (not judged, not scored)

← wind





F-21.01 Golf Ball with $\frac{3}{4}$ roll, snap roll, $\frac{3}{4}$ roll



From upright pull through a $\frac{3}{8}$ loop into a 45° upline, perform a $\frac{3}{4}$ roll, perform a $\frac{3}{4}$ knife-edge loop into a 45° downline with a snap-roll on top, perform a $\frac{3}{4}$ roll, pull through a $\frac{3}{8}$ loop to exit upright.

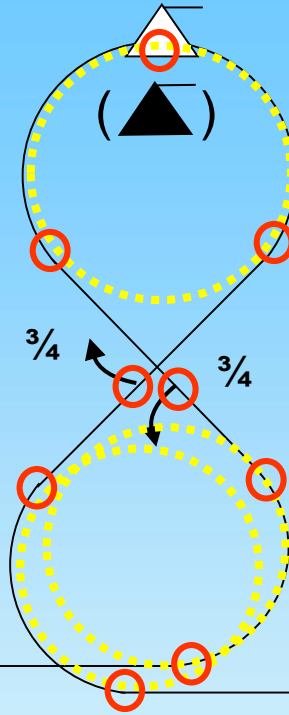




F-21.01 Golf Ball with $\frac{3}{4}$ roll, snap roll, $\frac{3}{4}$ roll

$\frac{3}{4}$ rolls centered on middle of the line.

All radii are equal.



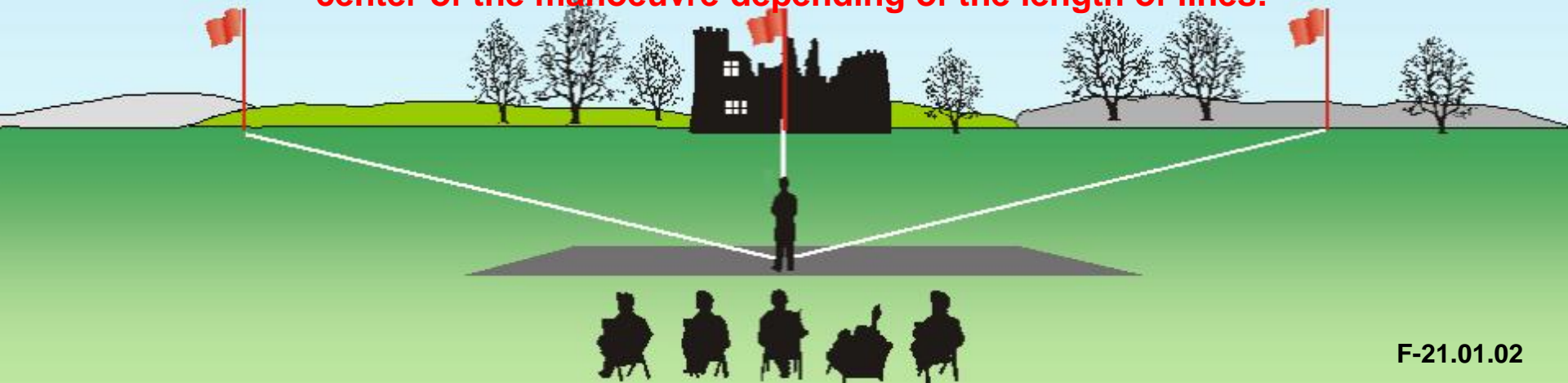
During Knife Edge the wing must be in the vertical plane.

Snap roll may be positive or negative.

If snap roll = barrel roll or aileron roll:
Severe downgrade > 5 pts.

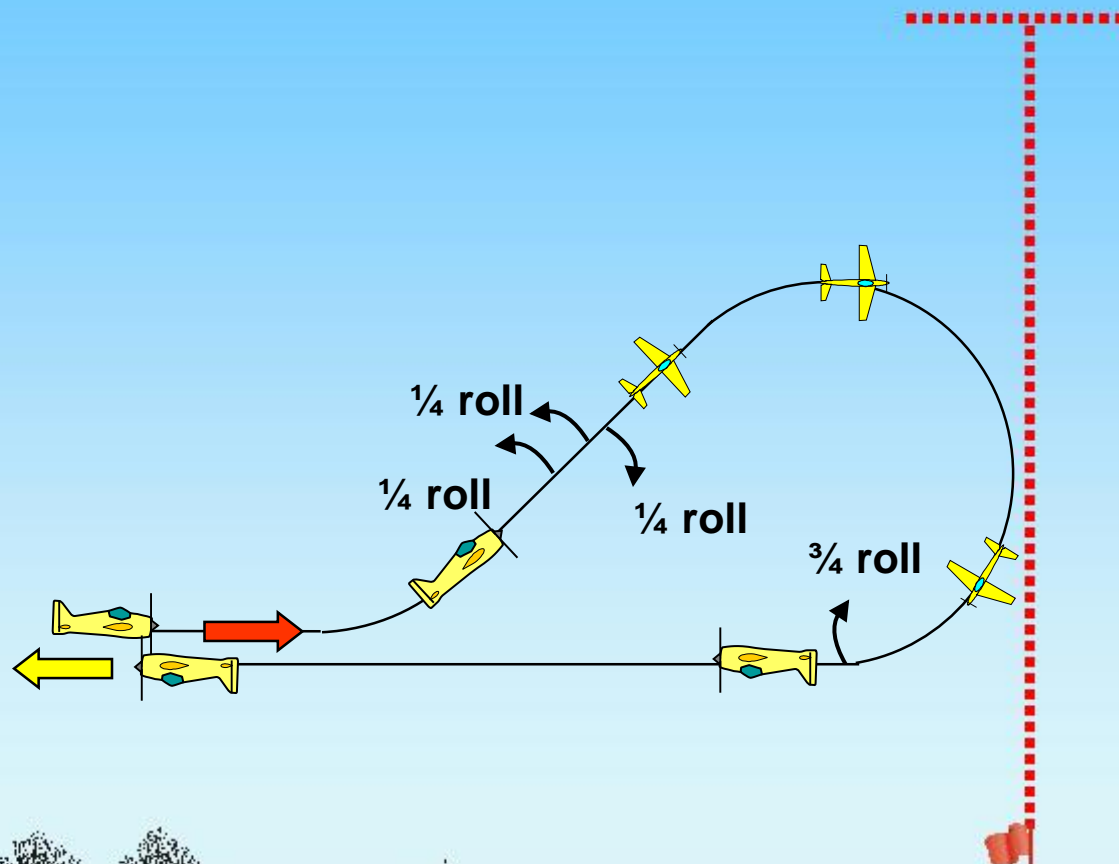
Entry and exit must be at the same altitude.

$\frac{3}{4}$ rolls on middle of the lines, but not necessarily in the center of the manoeuvre depending of the length of lines!





F-21.02 Half Reverse Cuban 8 with consecutive three $\frac{1}{4}$ rolls, with the third in opposite direction, $\frac{3}{4}$ roll



From upright pull through a $\frac{1}{8}$ loop into a 45° up-line, perform consecutively three $\frac{1}{4}$ rolls with the third in opposite direction, perform a $\frac{5}{8}$ knife-edge loop, perform a $\frac{3}{4}$ roll, exit inverted. Judging Note: There must be no line between the $\frac{5}{8}$ knife-edge loop and the $\frac{3}{4}$ roll.



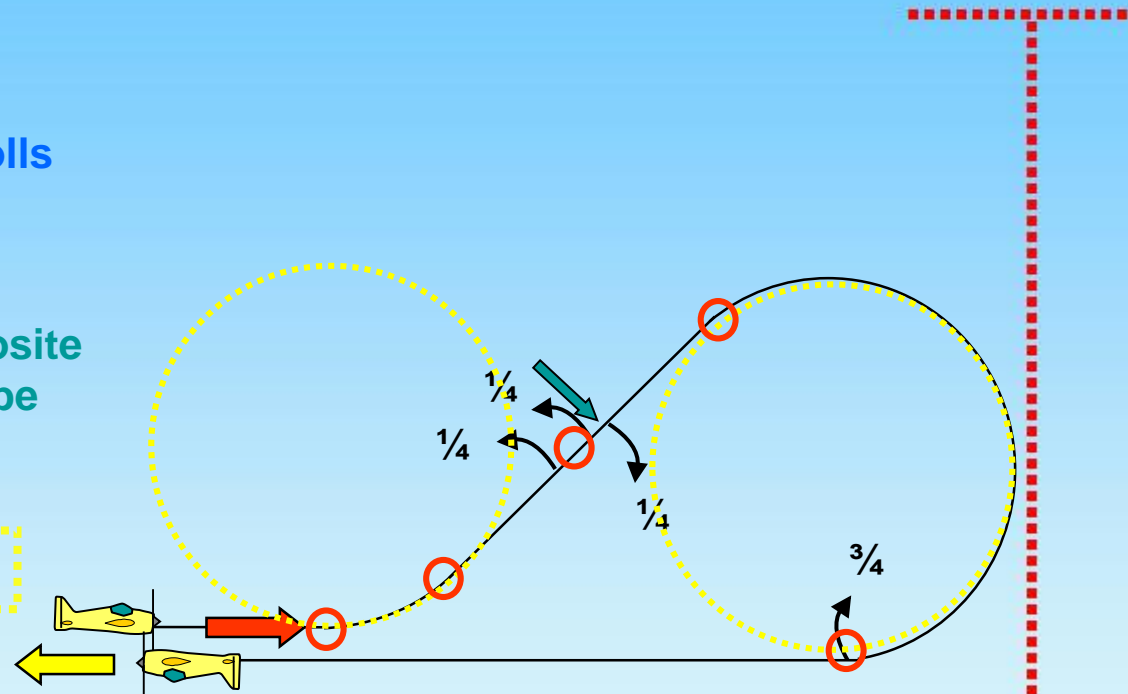
F-21.02 Half Reverse Cuban 8 with consecutive three $\frac{1}{4}$ rolls, with the third in opposite direction, $\frac{3}{4}$ roll

$\frac{1}{4}$ rolls centered on middle of the line.

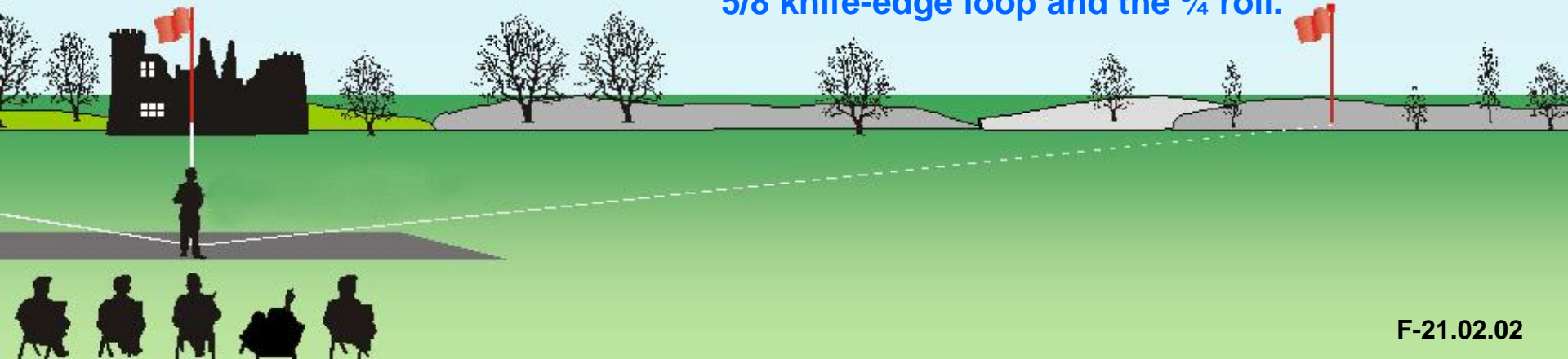
Lines between part rolls must be short and of recognizable length.

Between rolls in opposite direction there must be no line.

All radii are equal.

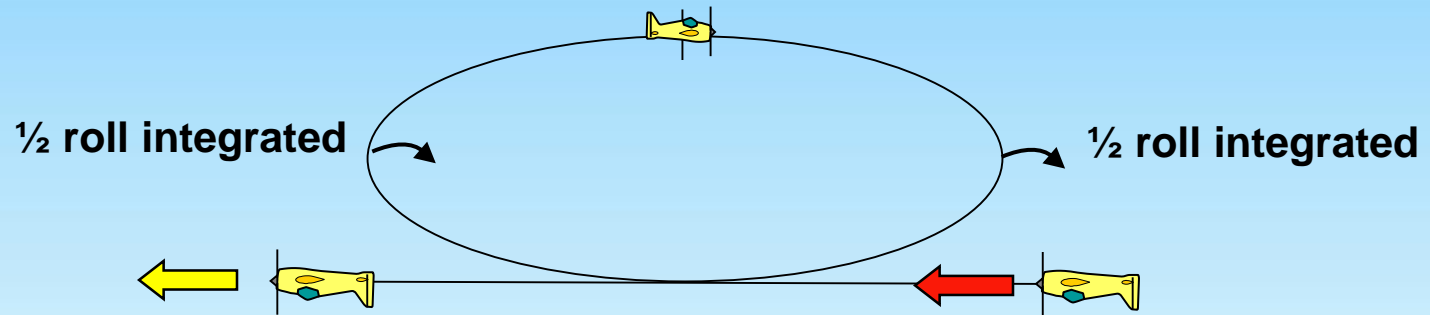


There must be no line between the $\frac{5}{8}$ knife-edge loop and the $\frac{3}{4}$ roll.





F-21.03 Horizontal Circle with two $\frac{1}{2}$ rolls opposite in opposite directions integrated



From inverted perform a horizontal circle with two $\frac{1}{2}$ rolls in opposite directions (first $\frac{1}{2}$ roll to the inside) integrated, exit inverted.



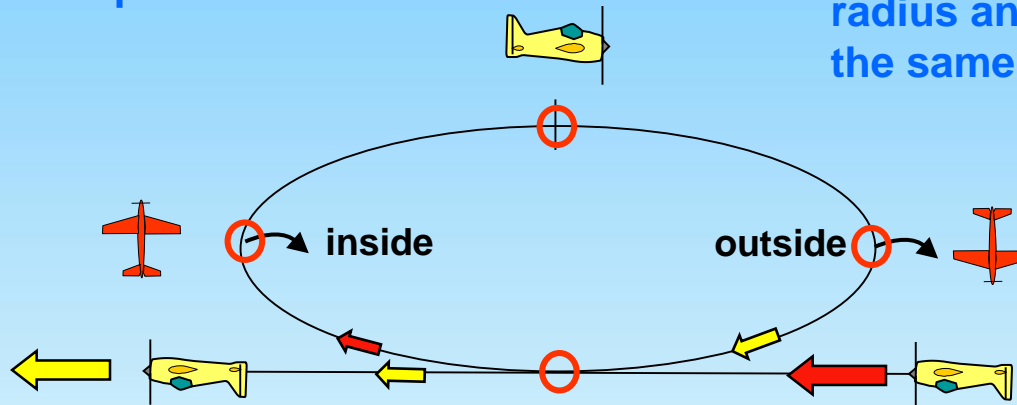


F-21.03 Horizontal Circle with two $\frac{1}{2}$ rolls opposite in opposite directions integrated

Roll reversal must be immediate.

Roll rates must be equal and constant.

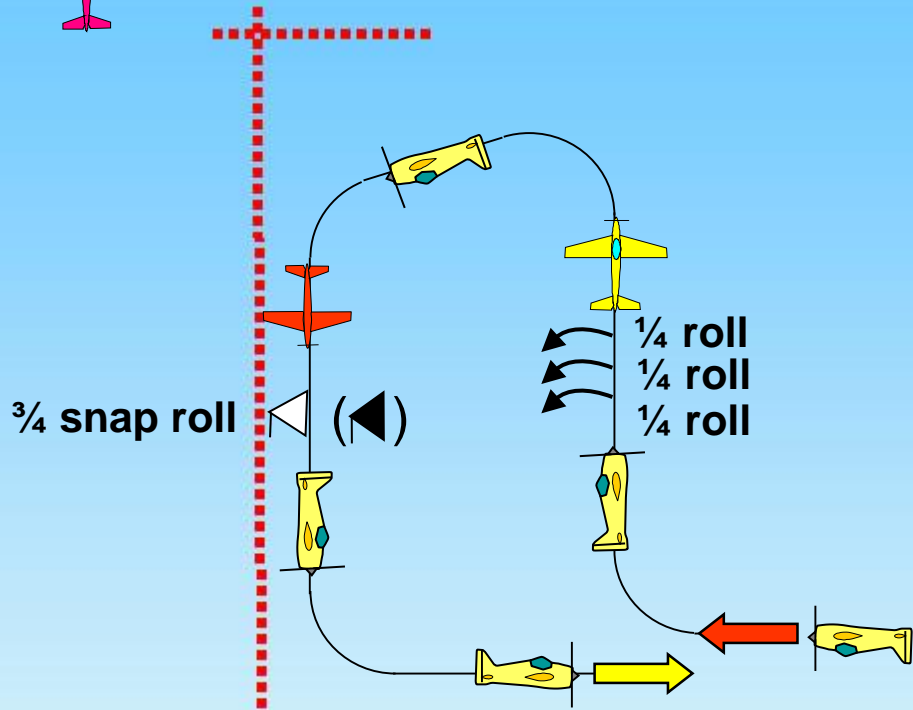
Circle must be of constant radius and must be flown at the same altitude.



The $\frac{1}{2}$ rolls must be integrated on circular flightpath.



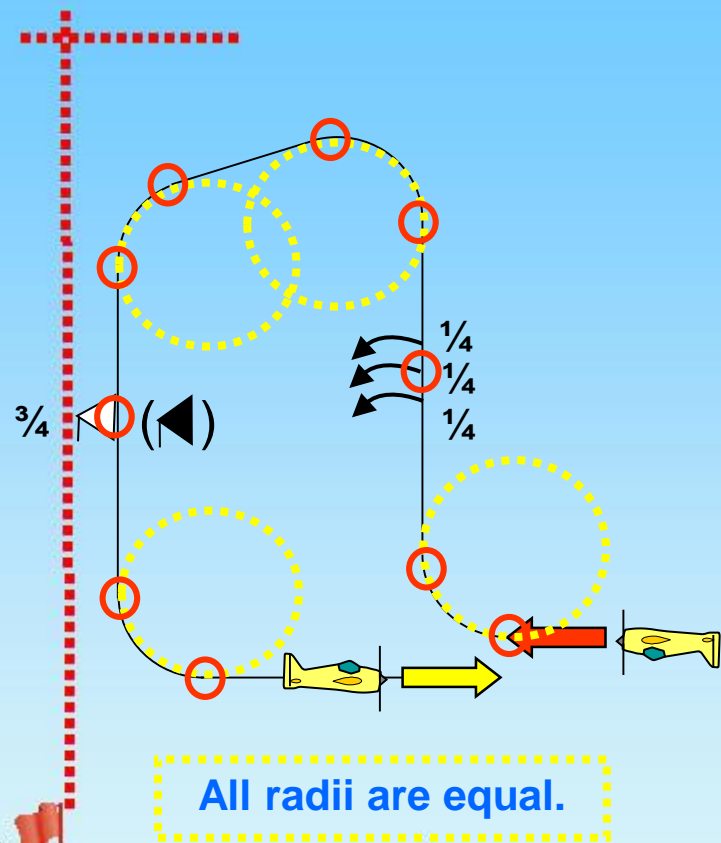
F-21.04 Top Hat with consecutive three $\frac{1}{4}$ rolls, $\frac{3}{4}$ snap-roll



From inverted push through a $\frac{1}{4}$ loop into a vertical upline, perform consecutively three $\frac{1}{4}$ rolls, pull through a $\frac{1}{4}$ loop into a horizontal line, pull through a $\wedge\frac{1}{4}$ loop into a vertical downline, perform a $\frac{3}{4}$ snap-roll, pull through a $\frac{1}{4}$ loop, exit upright.



F-21.04 Top Hat with consecutive three $\frac{1}{4}$ rolls, $\frac{3}{4}$ snap-roll



$\frac{1}{4}$ rolls and $\frac{3}{4}$ snap roll centered on middle of the line.

Lines between part rolls must be short and of equal length.

Snap roll may be positive or negative.

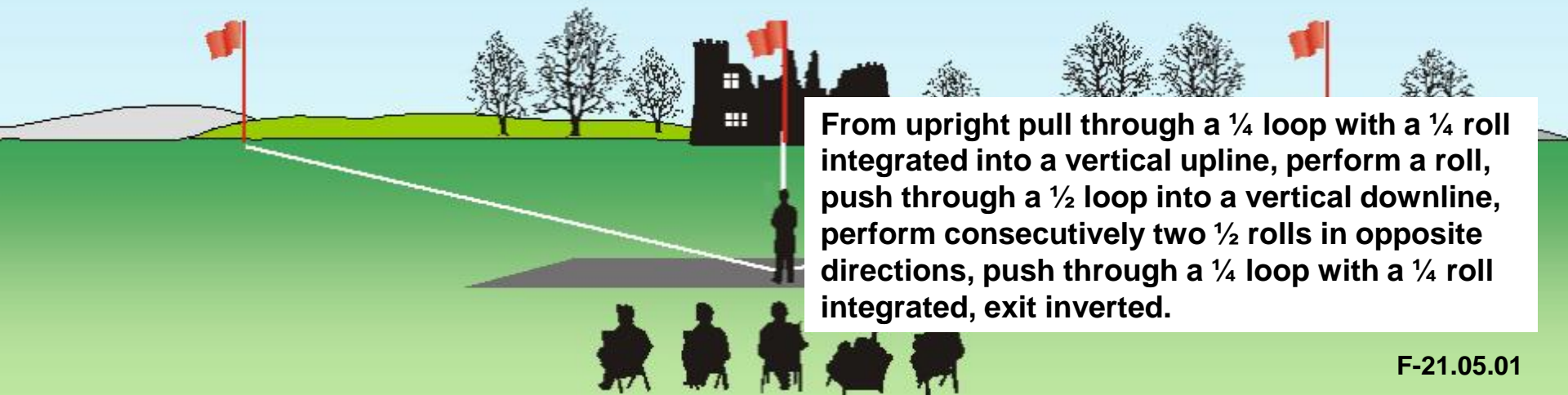
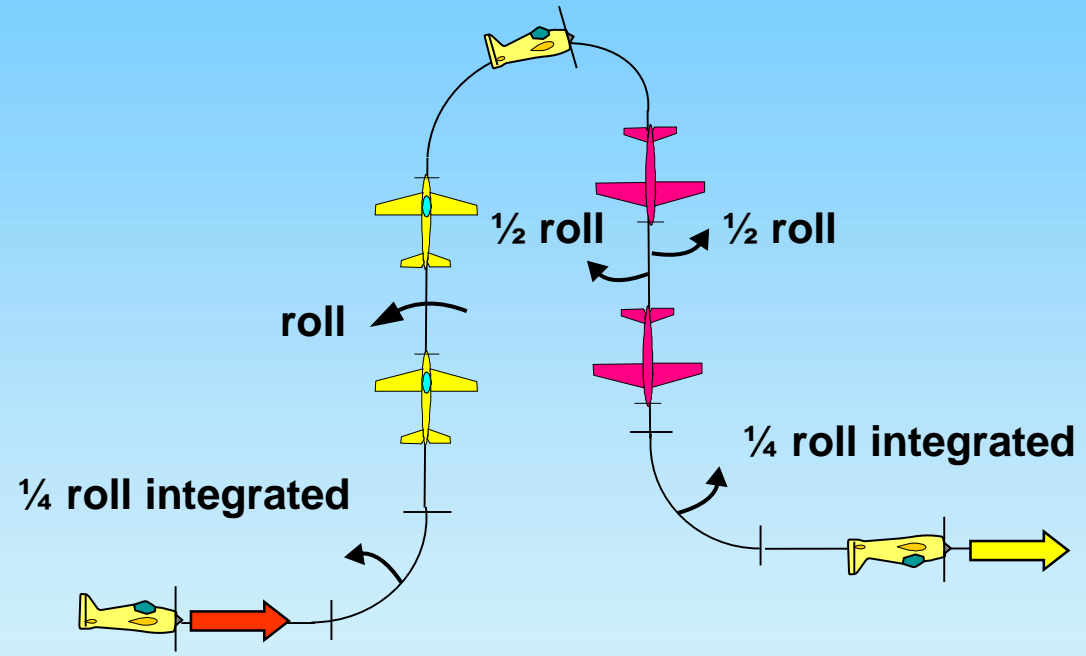
If snap roll = barrel roll or aileron roll:

Severe downgrade > 5 pts.





F-21.05 Pull-Push-Push Humpty-Bump, $\frac{1}{4}$ roll integrated, roll, consecutive two $\frac{1}{2}$ rolls in opposite directions, $\frac{1}{4}$ roll integrated



From upright pull through a $\frac{1}{4}$ loop with a $\frac{1}{4}$ roll integrated into a vertical upline, perform a roll, push through a $\frac{1}{2}$ loop into a vertical downline, perform consecutively two $\frac{1}{2}$ rolls in opposite directions, push through a $\frac{1}{4}$ loop with a $\frac{1}{4}$ roll integrated, exit inverted.



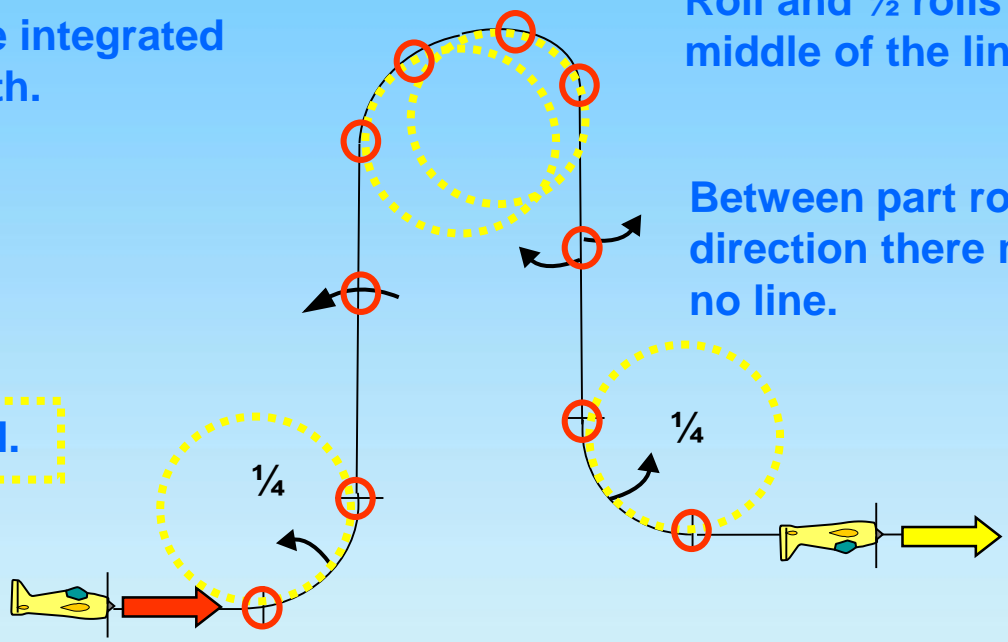
F-21.05 Pull-Push-Push Humpty-Bump, $\frac{1}{4}$ roll integrated, roll, consecutive two $\frac{1}{2}$ rolls in opposite directions, $\frac{1}{4}$ roll integrated

The $\frac{1}{4}$ rolls must be integrated on circular flightpath.

Roll and $\frac{1}{2}$ rolls centered on middle of the line.

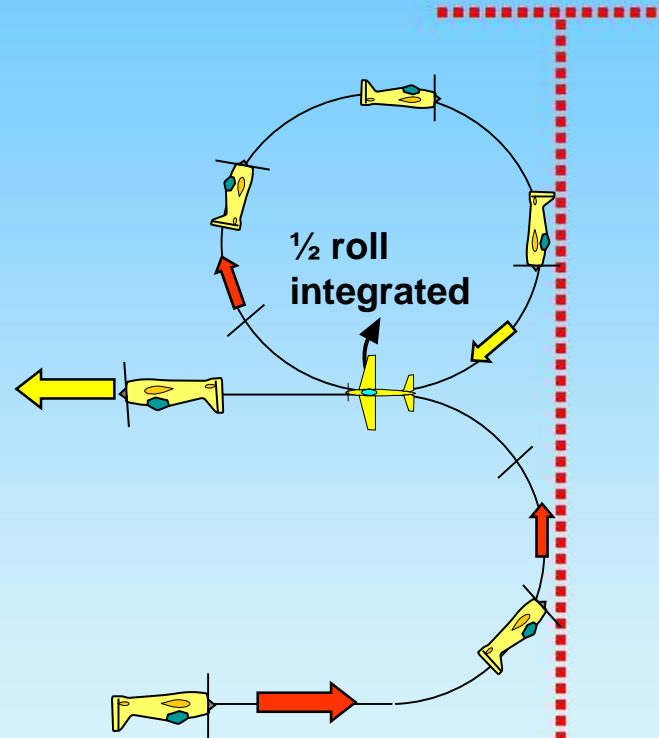
Between part rolls in opposite direction there must be no line.

All radii are equal.





F-21.06 Three Quarter Vertical 8 with $\frac{1}{2}$ roll integrated



From inverted push through a half loop and a loop with a $\frac{1}{2}$ roll integrated in the last 45° of the half loop and the first 45° of the loop, exit inverted.

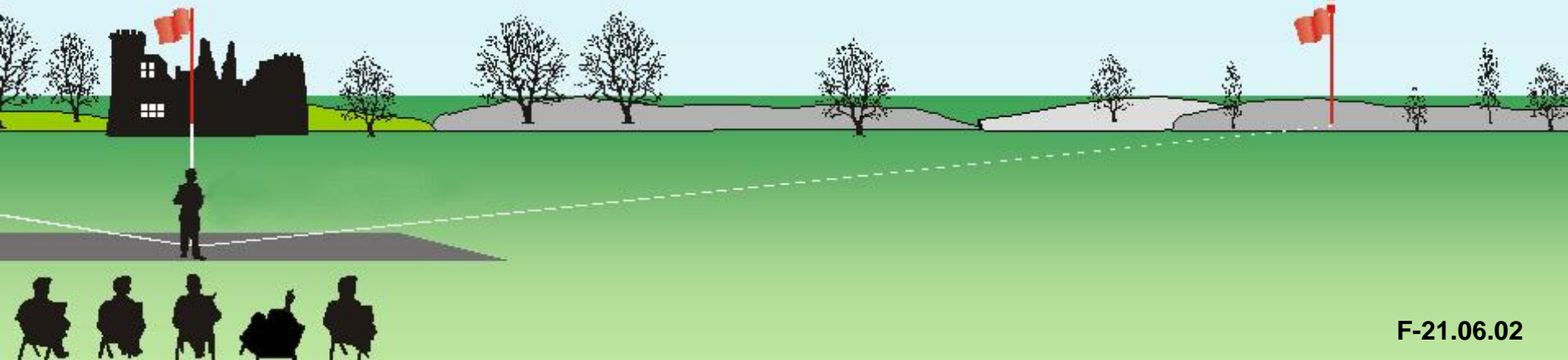
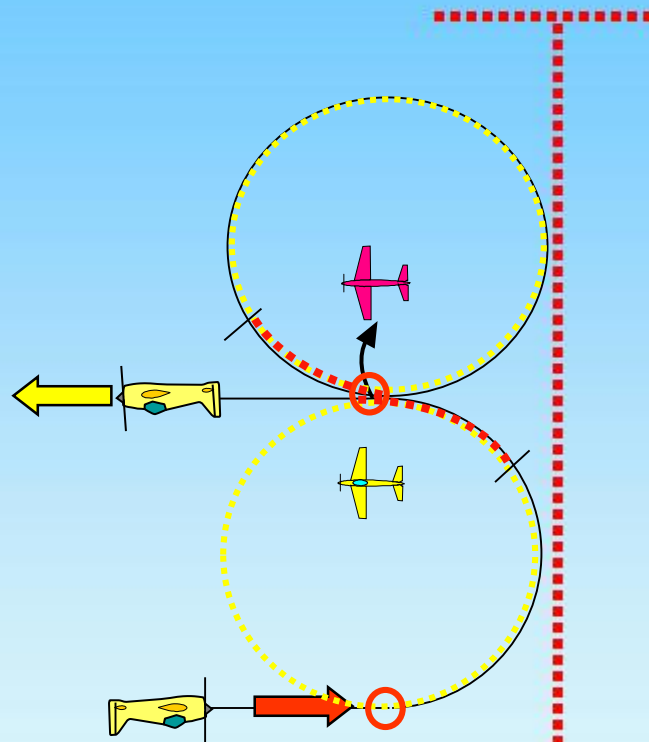


F-21.06 Three Quarter Vertical 8 with $\frac{1}{2}$ roll integrated

Loops must be round

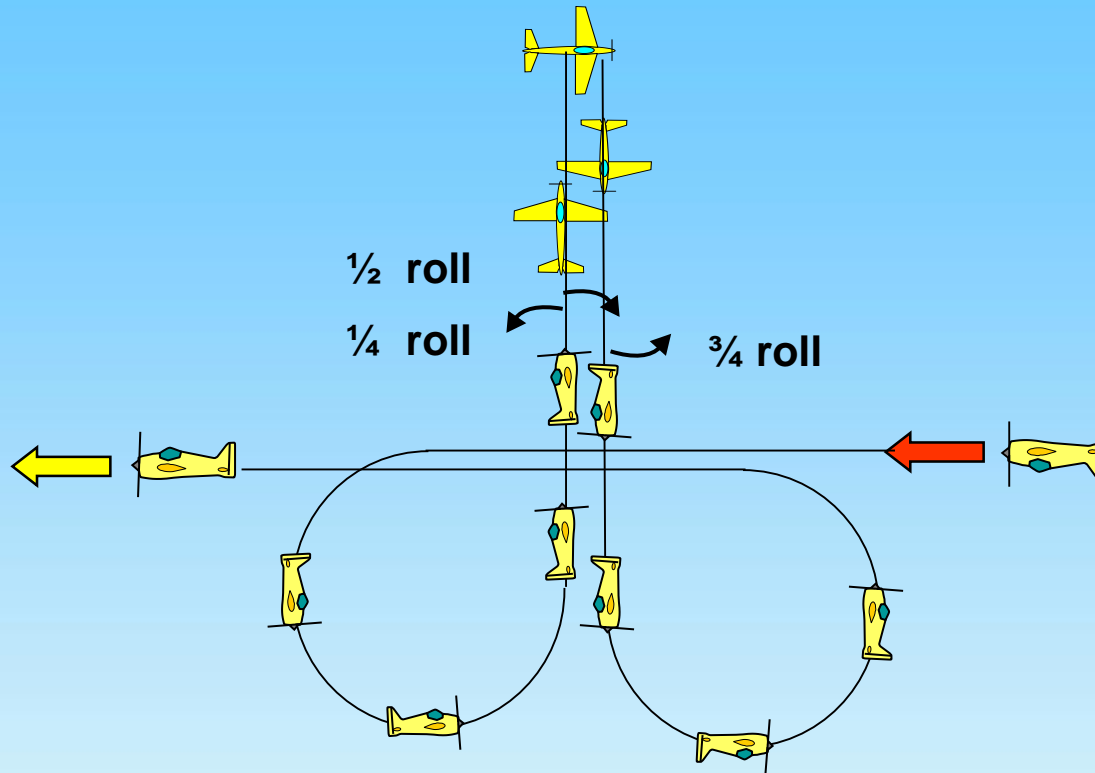
$\frac{1}{2}$ roll must be integrated on circular flightpath in the last 45° of the first $\frac{1}{2}$ loop and in the first 45° of the second loop.

All radii are equal.





F-21.07 Stall-Turn with consecutive $\frac{1}{4}$, $\frac{1}{2}$ rolls, $\frac{3}{4}$ roll



From inverted pull through a $\frac{3}{4}$ loop into a vertical upline, perform a $\frac{1}{4}$ roll and a $\frac{1}{2}$ roll in opposite direction, perform a stall turn into a vertical downline, perform a $\frac{3}{4}$ roll, push through a $\frac{3}{4}$ loop, exit upright.

F-21.07 Stall-Turn with consecutive $\frac{1}{4}$, $\frac{1}{2}$ rolls, $\frac{3}{4}$ roll

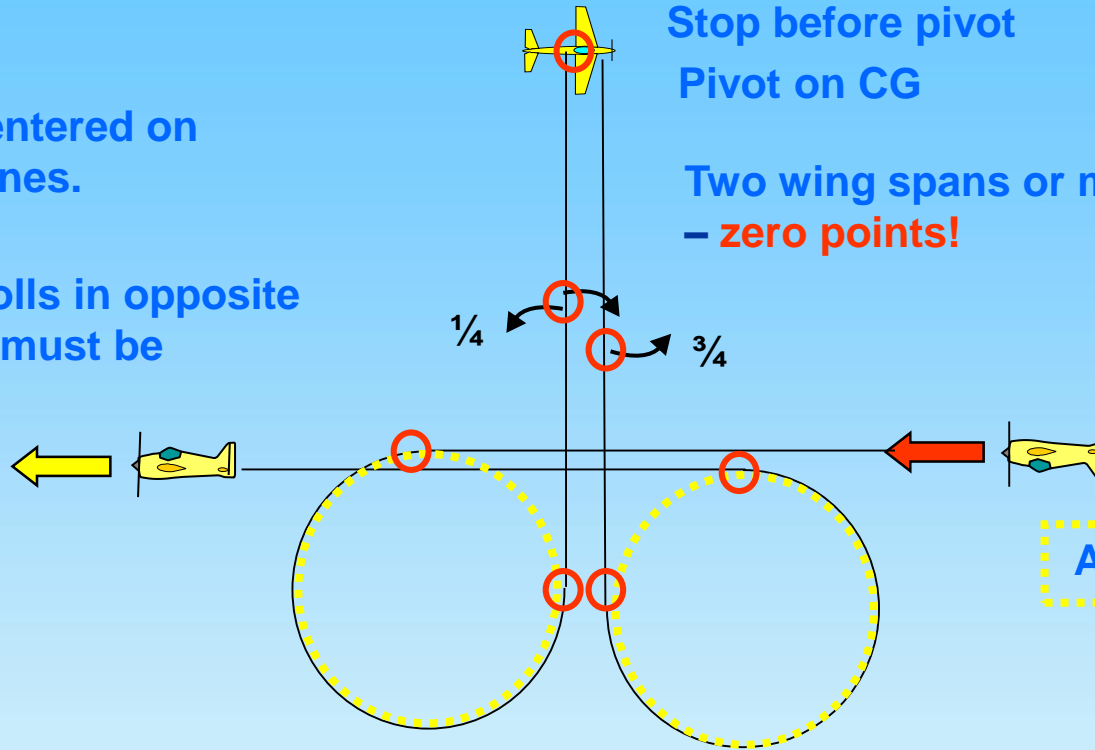


All part rolls centered on middle of the lines.

Between part rolls in opposite direction there must be no line.

Stop before pivot
Pivot on CG

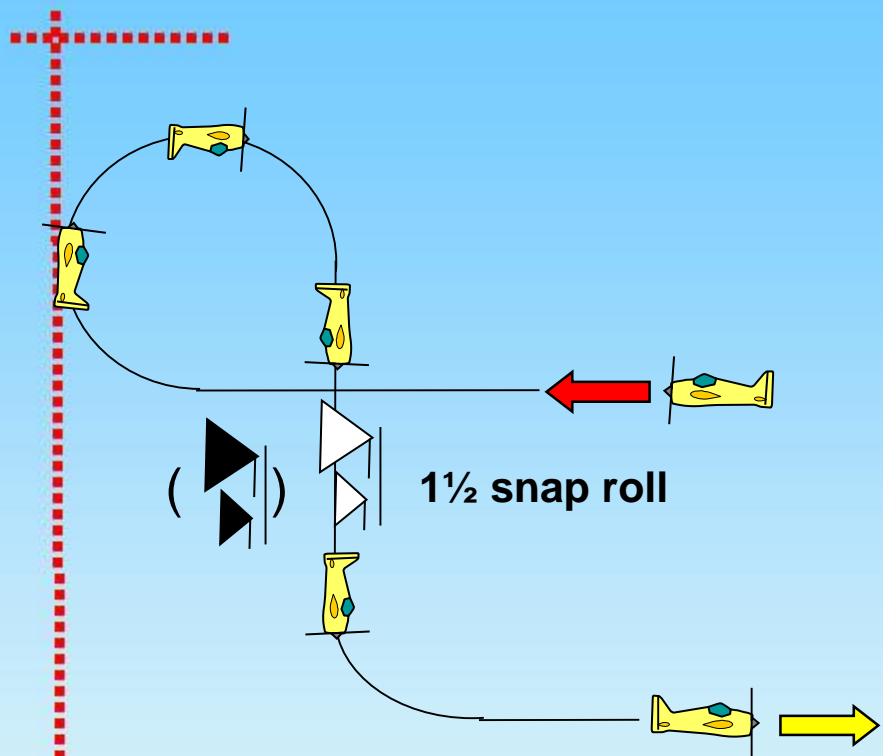
Two wing spans or more
– zero points!



All radii are equal.



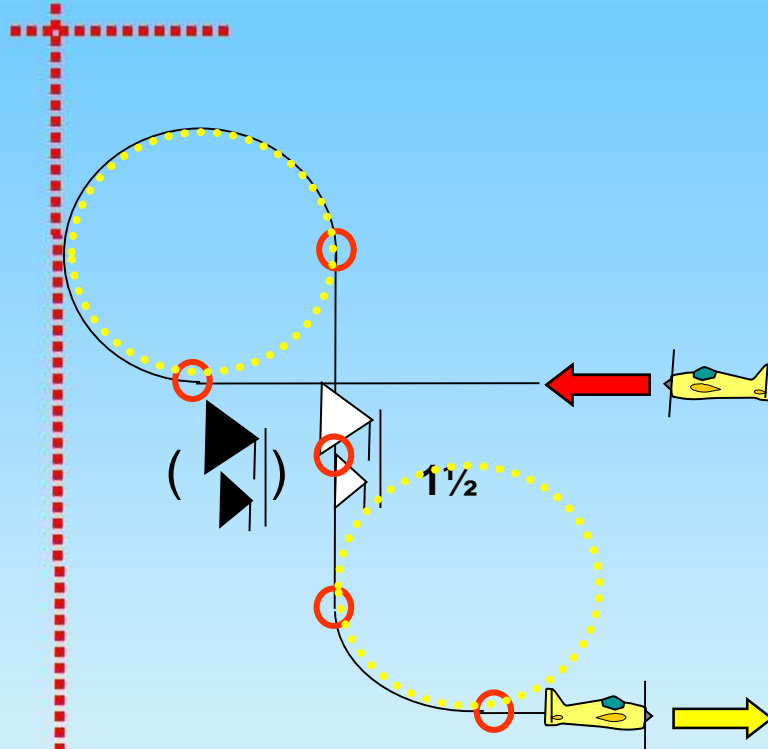
F-21.08 Figure 9 with 1 ½ snap-roll



From upright, pull through a $\frac{3}{4}$ loop into a vertical downline, perform 1 $\frac{1}{2}$ snap-roll, pull through a $\frac{1}{4}$ loop, exit upright.



F-21.08 Figure 9 with 1 ½ snap-roll



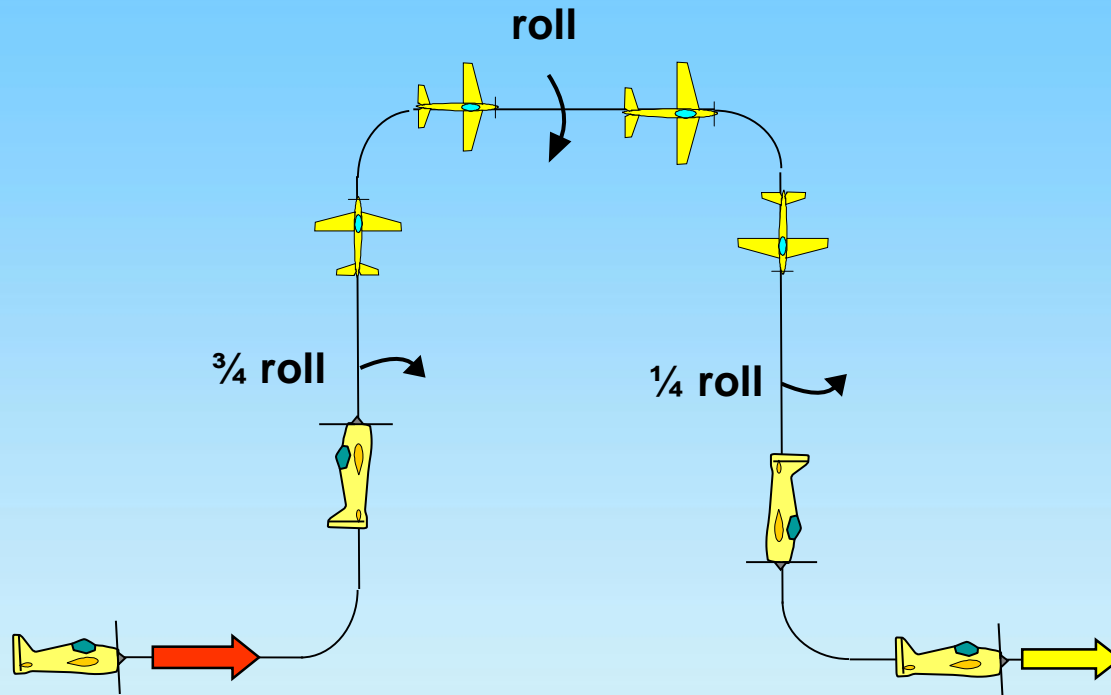
Snap roll on middle of the line.

All radii are equal.





F-21.09 Top-hat with $\frac{3}{4}$ roll, roll, $\frac{1}{4}$ roll

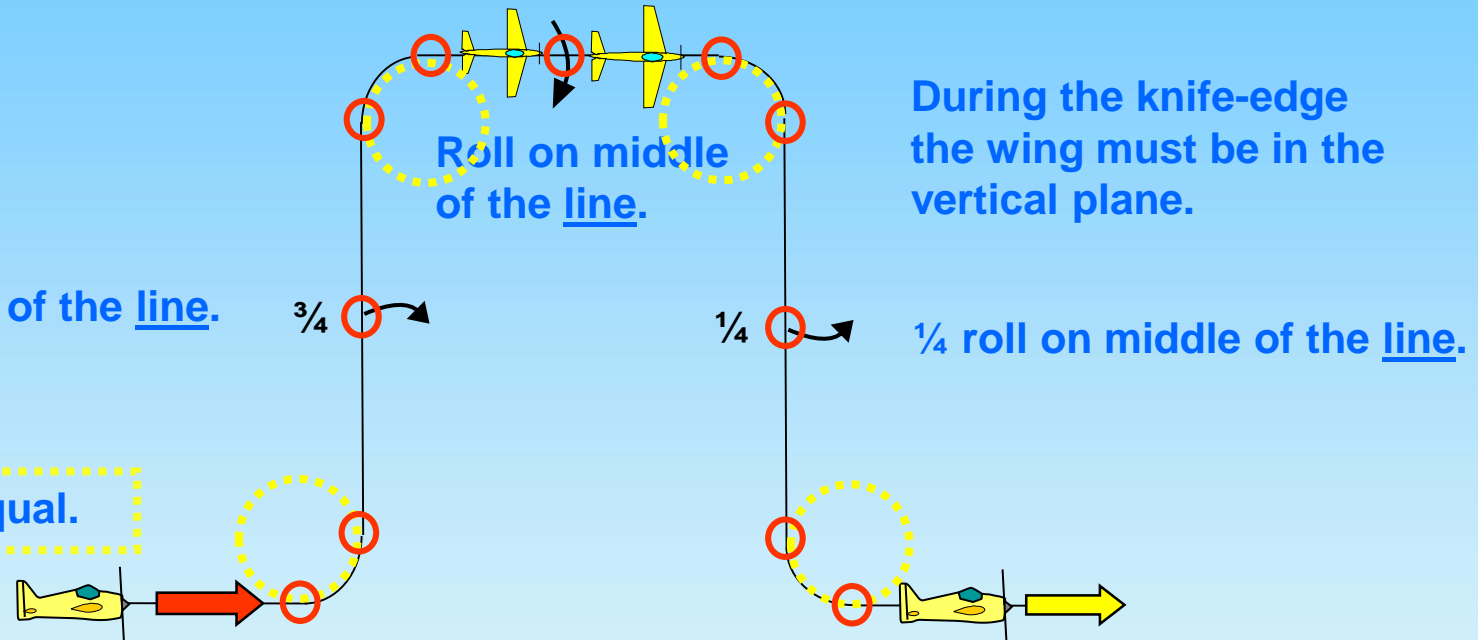


From upright pull through a $\frac{1}{4}$ loop into a vertical upline, perform a $\frac{3}{4}$ roll, perform a $\frac{1}{4}$ knife-edge loop into a horizontal line, perform a roll, perform a $\frac{1}{4}$ knife-edge loop into a vertical downline, perform a $\frac{1}{4}$ roll, pull through a $\frac{1}{4}$ loop, exit upright.



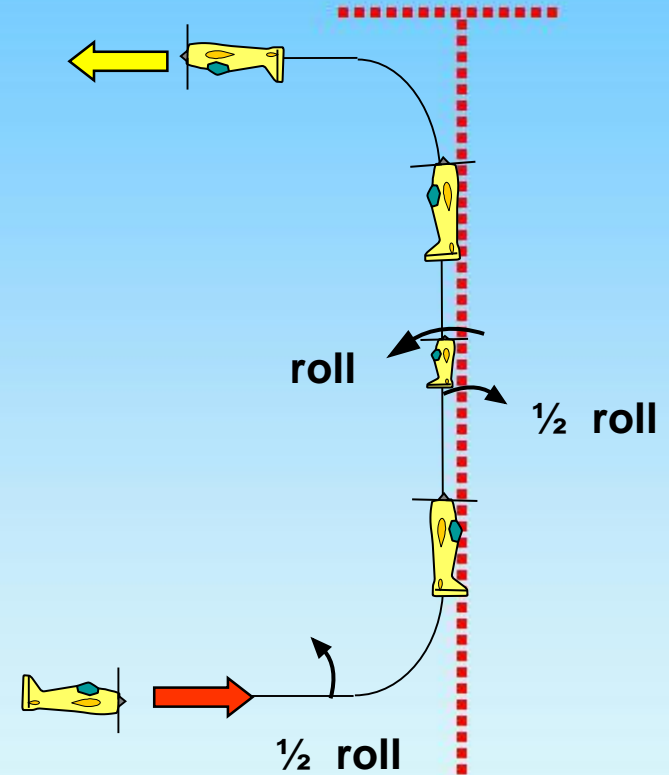
F-21.09 Top-hat with $\frac{3}{4}$ roll, roll, $\frac{1}{4}$ roll

The length of the top line of the Top Hat does not necessarily need to be equal to the length of the vertical lines.





F-21.10 Half Square Loop with $\frac{1}{2}$ roll, consecutive $\frac{1}{2}$ roll, roll



From upright perform a $\frac{1}{2}$ roll, push through a $\frac{1}{4}$ loop into a vertical upline, perform consecutively a $\frac{1}{2}$ roll, a roll in opposite directions, pull through a $\frac{1}{4}$ loop, exit inverted. Judging Note: There must be no line between the first $\frac{1}{2}$ roll and the $\frac{1}{4}$ loop.

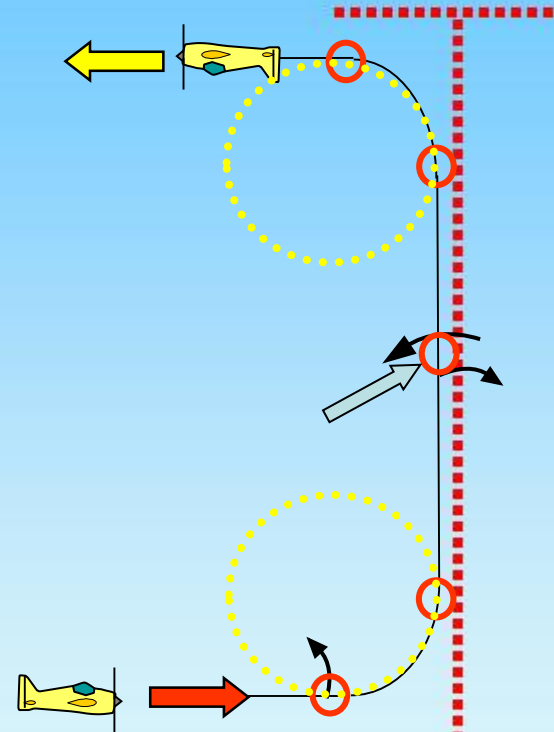


F-21.10 Half Square Loop with $\frac{1}{2}$ roll, consecutive $\frac{1}{2}$ roll, roll

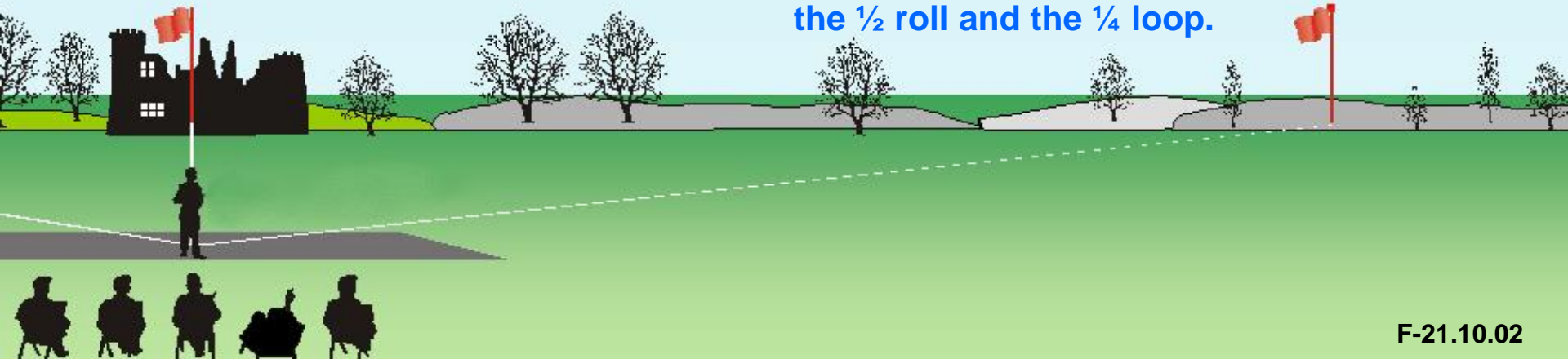
$\frac{1}{2}$ roll and roll centered on middle of the line.

Between part rolls and rolls in opposite direction there must be no line.

All radii are equal.

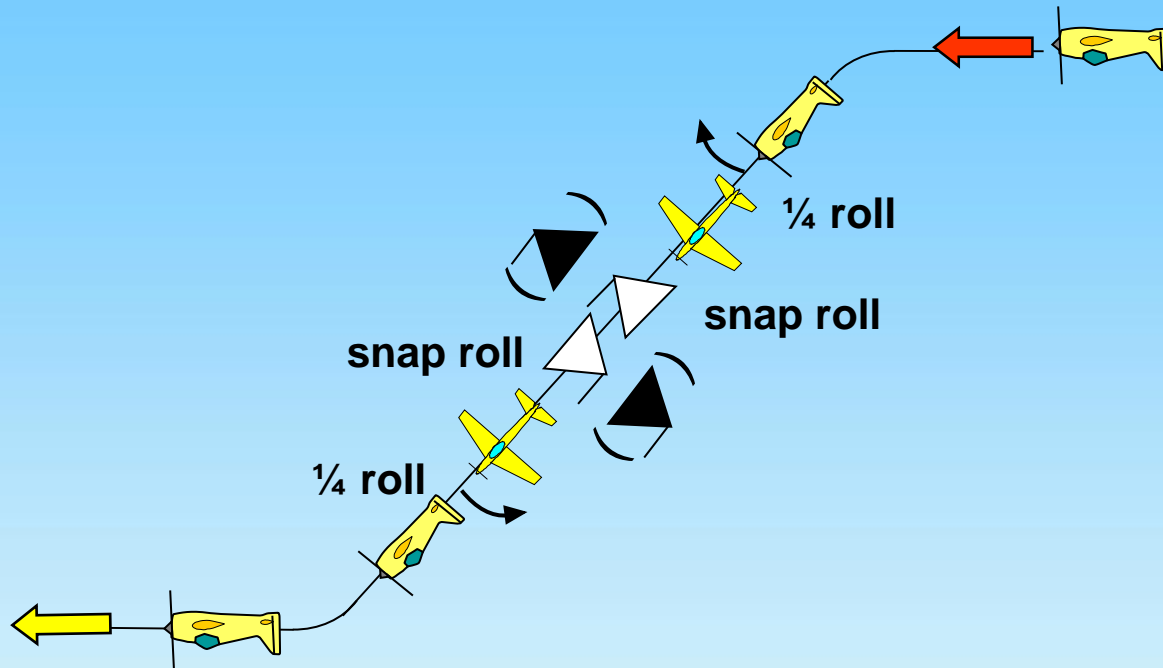


There must be no line between the $\frac{1}{2}$ roll and the $\frac{1}{4}$ loop.





F-21.11 45° Downline with $\frac{1}{4}$ roll, consecutive two snap-rolls in opposite directions, $\frac{1}{4}$ roll



From inverted pull through a $\frac{1}{8}$ loop into a 45° downline, perform a $\frac{1}{4}$ roll, perform consecutively two snap-rolls in opposite directions, perform a $\frac{1}{4}$ roll, push through a $\frac{1}{8}$ loop, exit inverted.



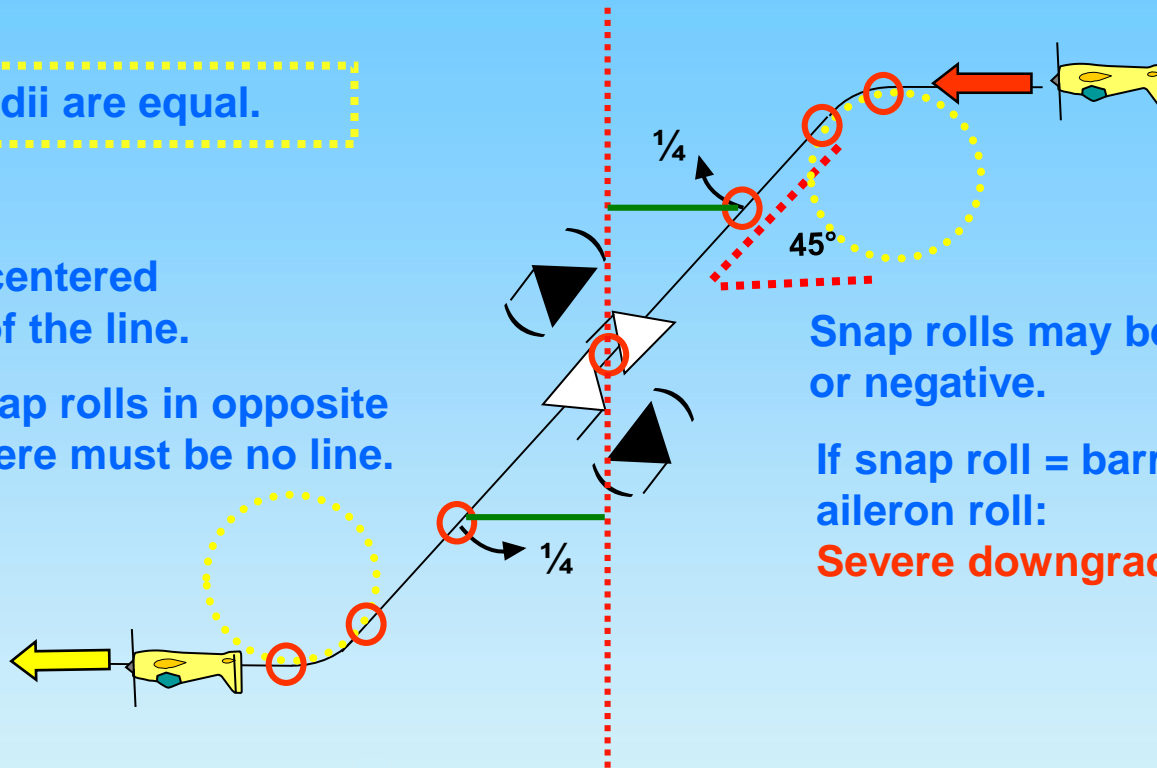


F-21.11 45° Downline with $\frac{1}{4}$ roll, consecutive two snap-rolls in opposite directions, $\frac{1}{4}$ roll

All radii are equal.

Snap rolls centered on middle of the line.

Between snap rolls in opposite direction there must be no line.



Snap rolls may be positive or negative.

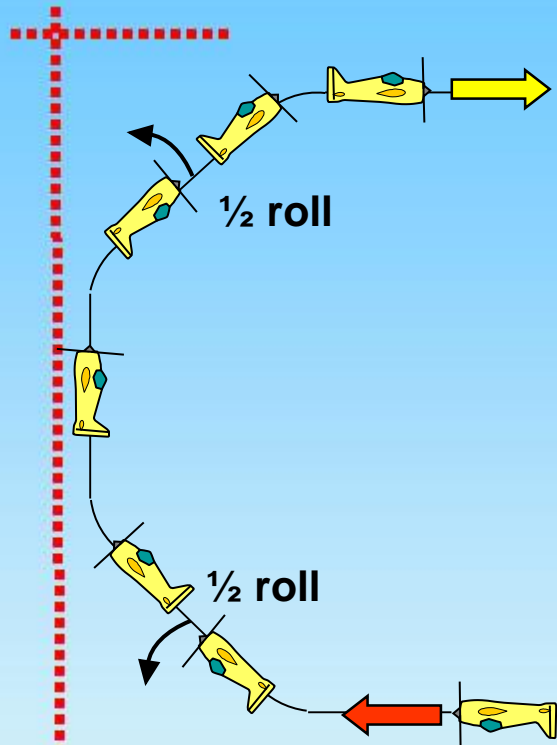
If snap roll = barrel roll or aileron roll:

Severe downgrade > 5 pts.

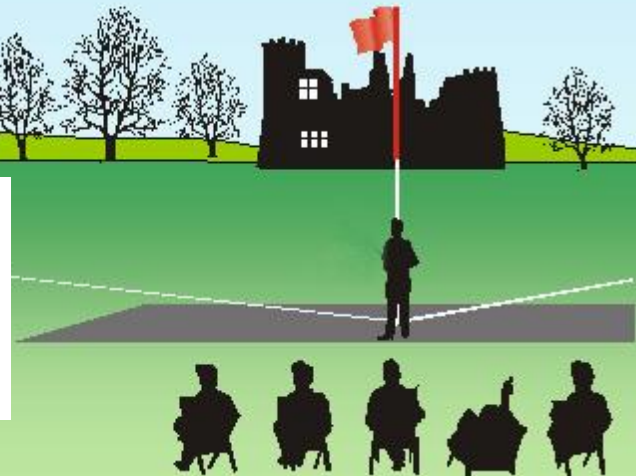




F-21.12 Half 8-sided Loop with $\frac{1}{2}$ roll, $\frac{1}{2}$ roll

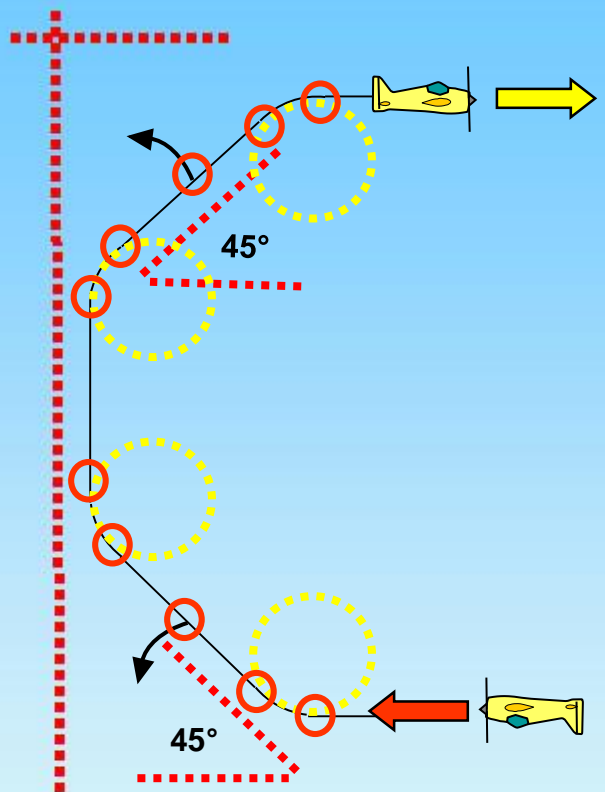


From inverted, push through a $\frac{1}{8}$ loop into a 45° upline, perform a $\frac{1}{2}$ roll, pull through a $\frac{1}{8}$ loop into a vertical upline, pull through a $\frac{1}{8}$ loop into a 45° upline, perform a $\frac{1}{2}$ roll, push through a $\frac{1}{8}$ loop, exit upright.



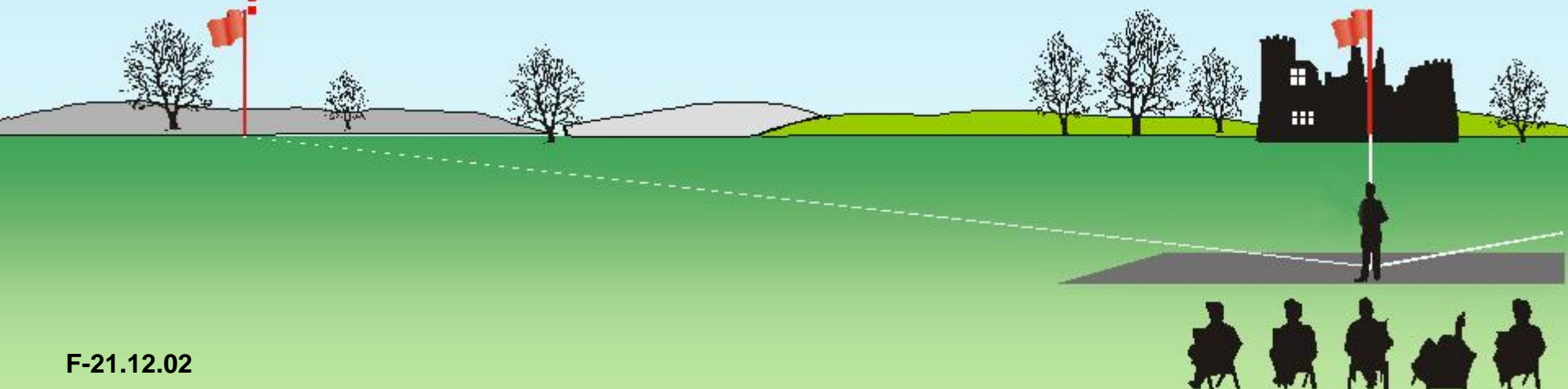


F-21.12 Half 8-sided Loop with 1/2 roll, 1/2 roll



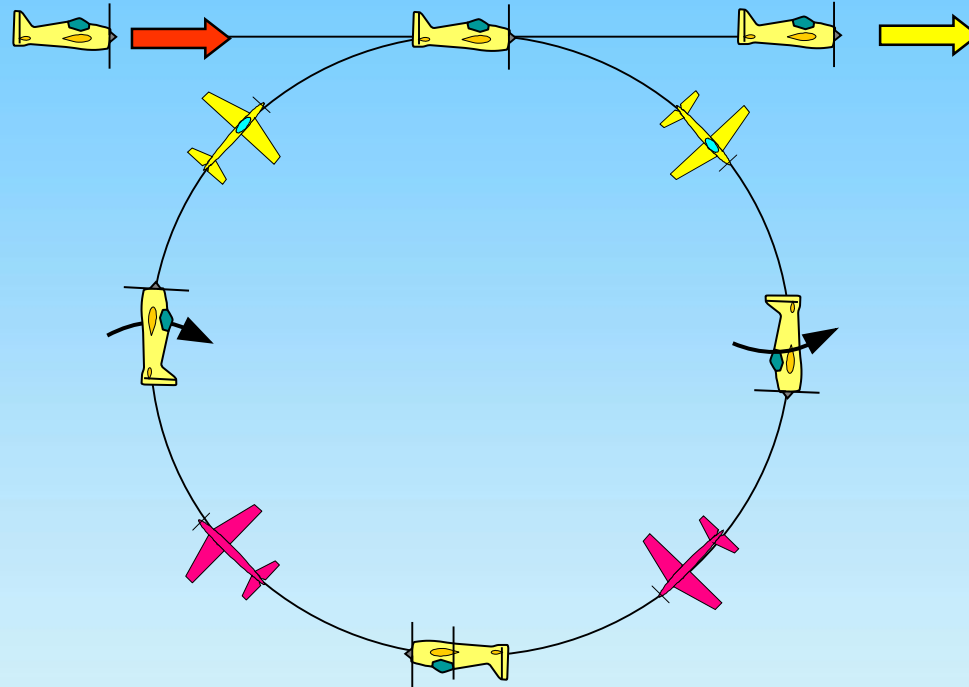
1/2 rolls on middle of the lines.

All radii are equal.





F-21.13 Loop with consecutive two rolls in opposite directions integrated



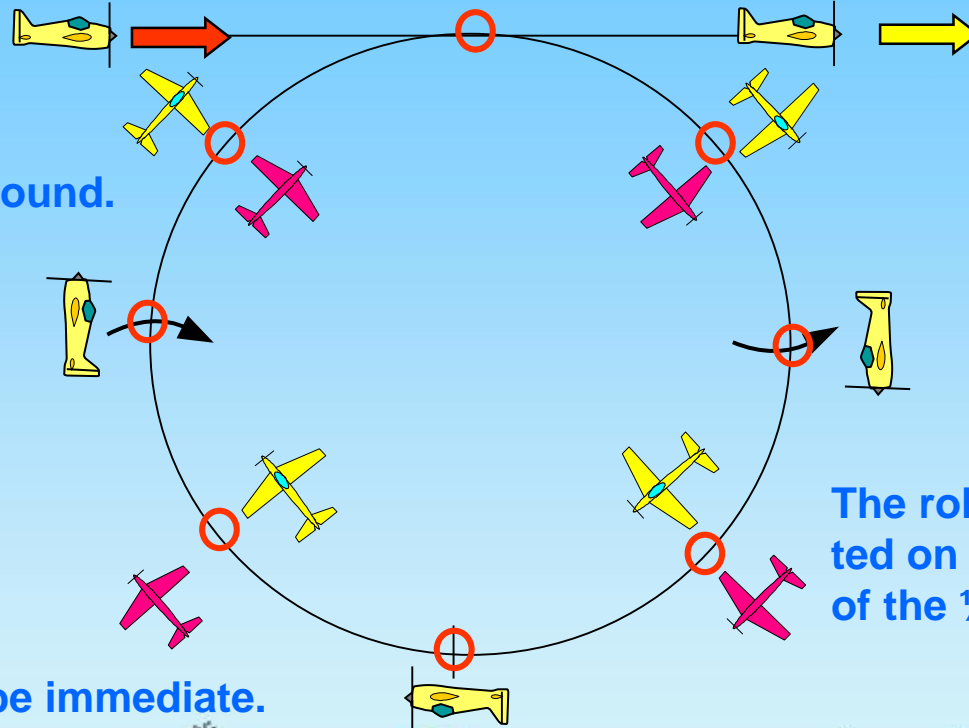
From upright push through a loop with consecutively two rolls in opposite directions integrated, exit upright.





F-21.13 Loop with consecutive two rolls in opposite directions integrated

The loop must be round.

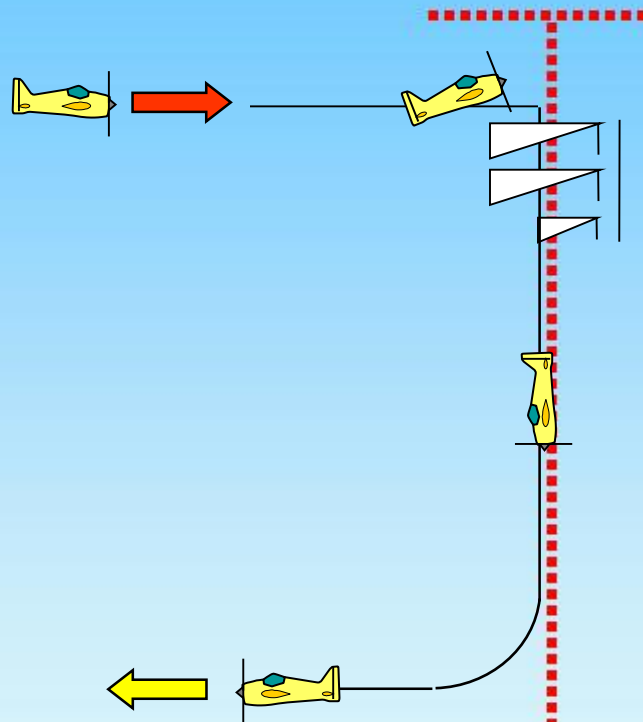


The rolls must be integrated on circular flightpath of the $\frac{1}{2}$ loops.

Roll reversal must be immediate.



F-21.14 Spin with 2 ½ turns



From upright perform a spin with 2 ½ turns, pull through a ¼ loop, exit upright.

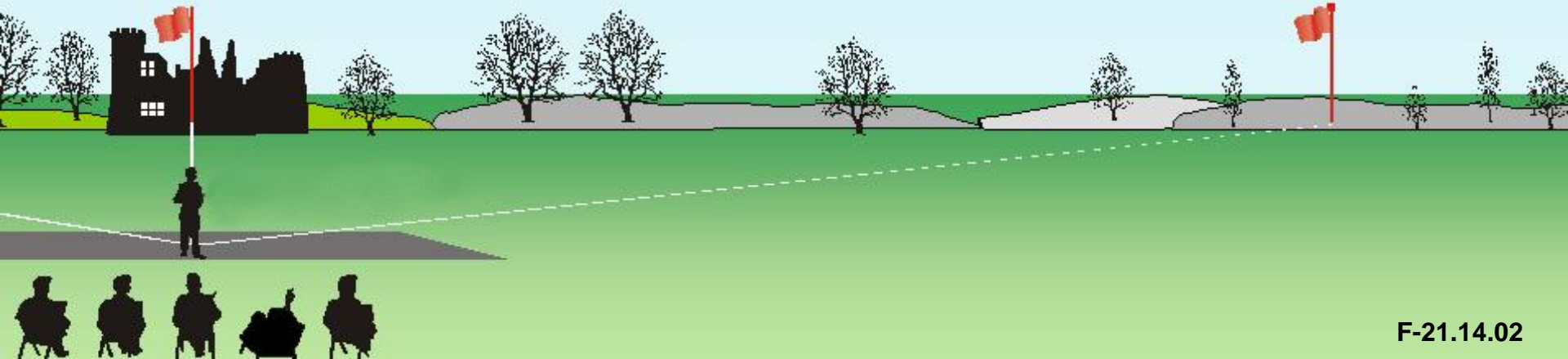
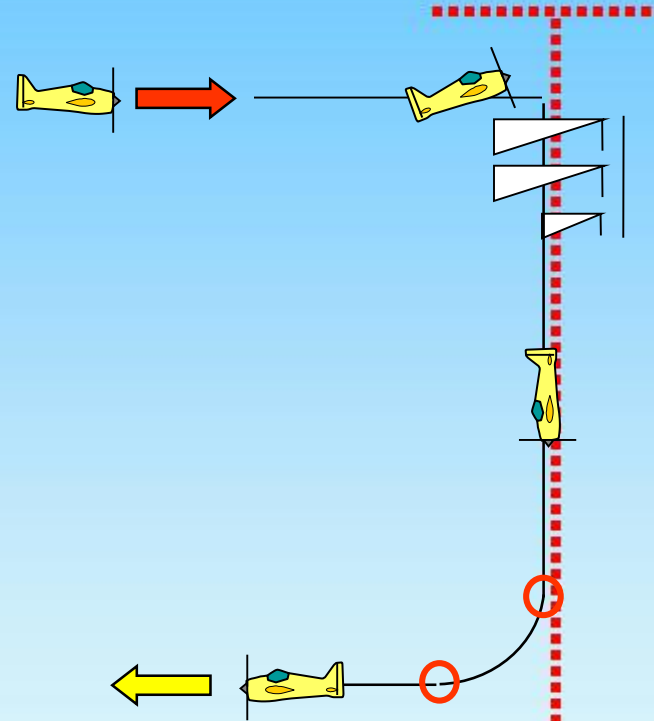


F-21.14 Spin with 2 ½ turns

Snap entry - zero points!

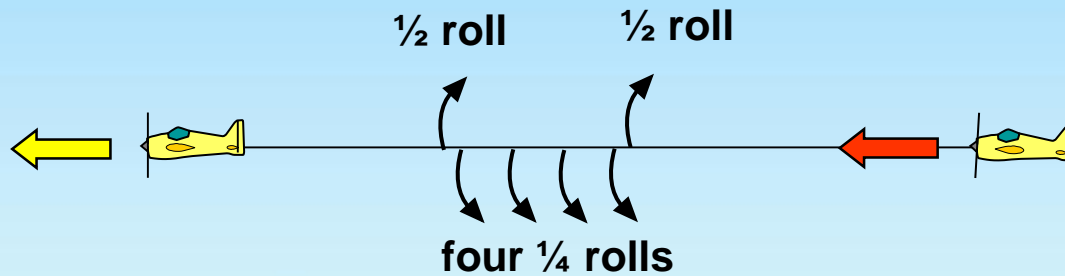
Spiral dive - zero points!

Forced entry - downgrade.





F-21.15 Roll Combination with consecutive $\frac{1}{2}$ roll, four $\frac{1}{4}$ rolls in opposite direction, $\frac{1}{2}$ roll in opposite direction.



From upright perform consecutively a $\frac{1}{2}$ roll, four $\frac{1}{4}$ rolls in opposite direction, a $\frac{1}{2}$ roll in opposite direction, exit upright.

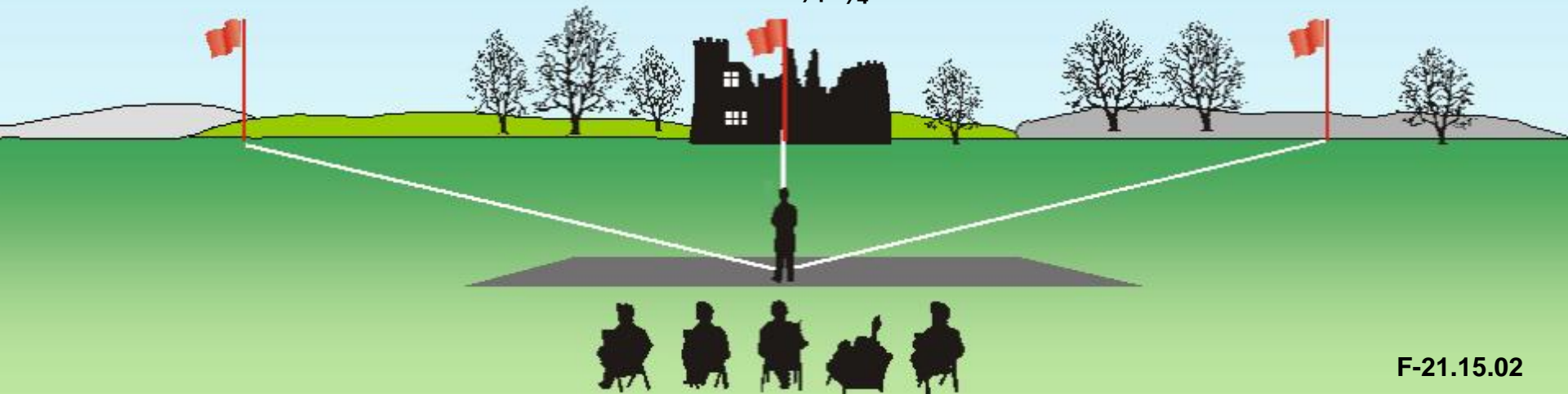
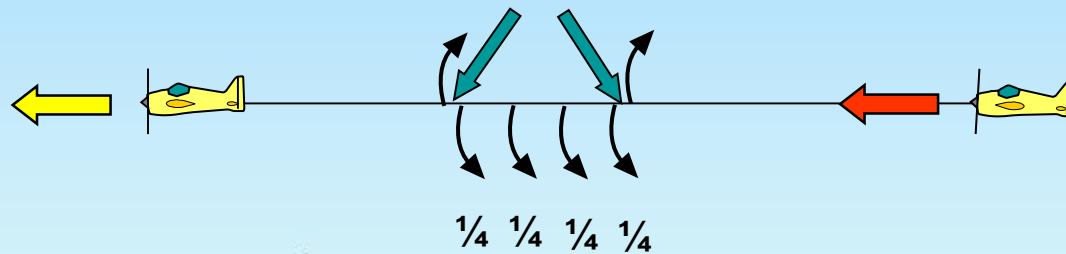




F-21.15 Roll Combination with consecutive $\frac{1}{2}$ roll, four $\frac{1}{4}$ rolls in opposite direction, $\frac{1}{2}$ roll in opposite direction.

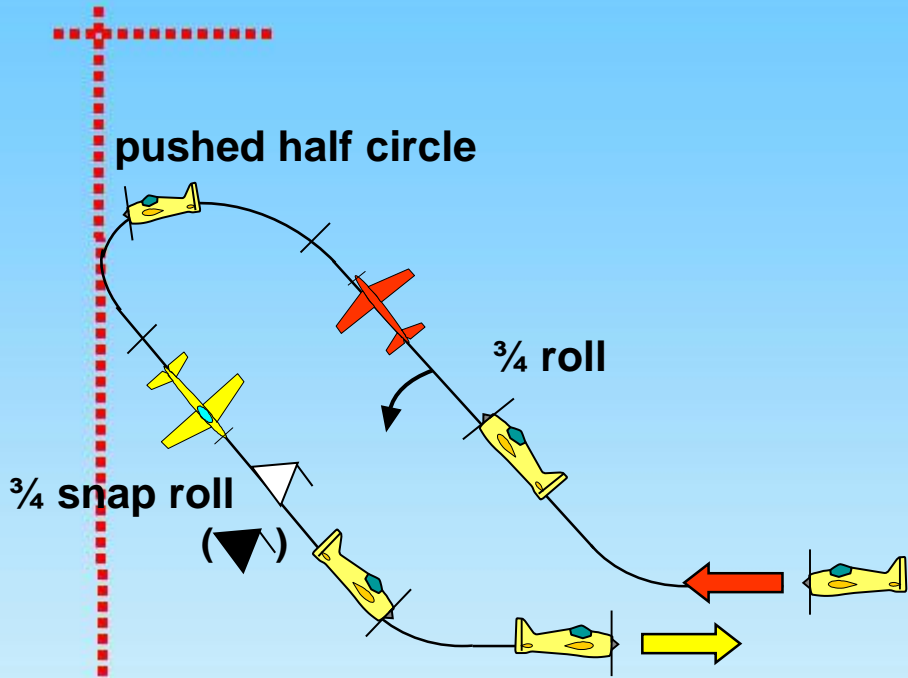
Lines between part rolls must be short and of equal length.

Between rolls in opposite direction there must be no line.





F-21.16 Fighter turn, $\frac{3}{4}$ roll, $\frac{3}{4}$ snap-roll

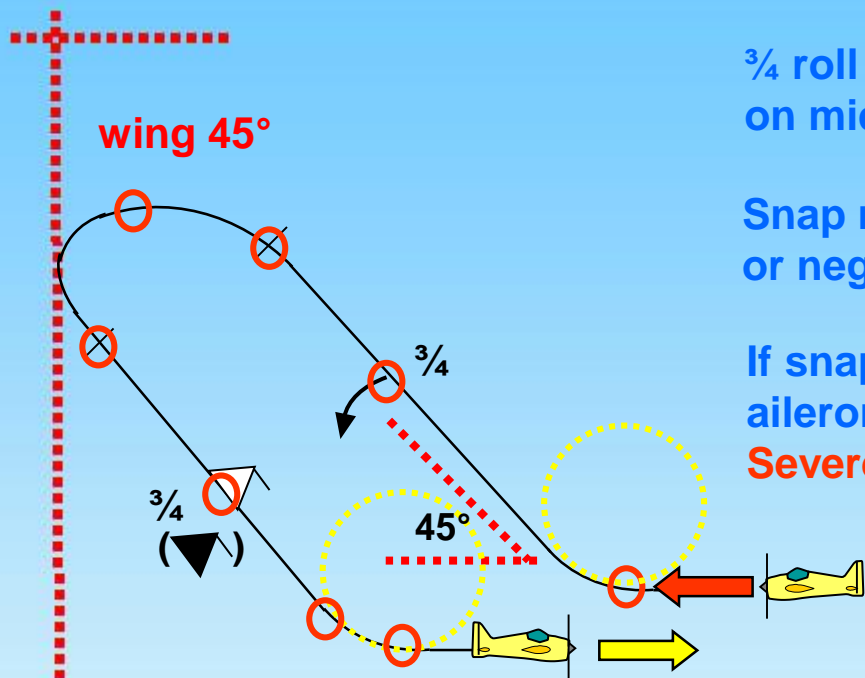


From upright pull through a $\frac{1}{8}$ loop into a 45° up-line, perform a $\frac{3}{4}$ roll, push through a $\frac{1}{2}$ circle into a 45° downline, perform a $\frac{3}{4}$ snap-roll, pull through a $\frac{1}{8}$ loop, exit upright.





F-21.16 Fighter turn, $\frac{3}{4}$ roll, $\frac{3}{4}$ snap-roll



$\frac{3}{4}$ roll and $\frac{3}{4}$ snap roll
on middle of the line.

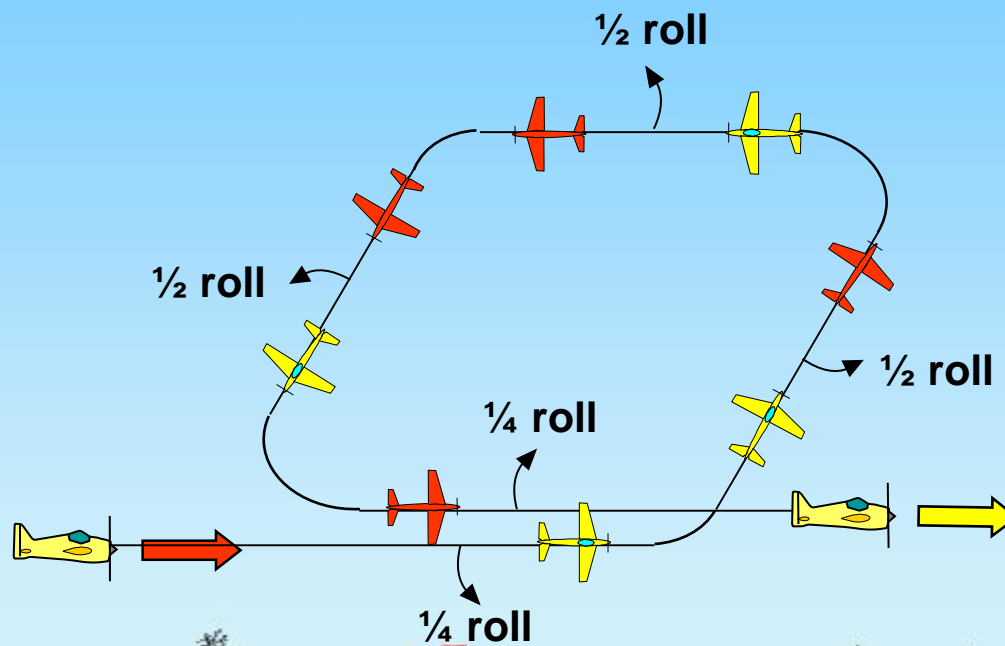
Snap rolls may be positive
or negative.

If snap roll = barrel roll or
aileron roll:
Severe downgrade > 5 pts.

The radii of the 1/8 loops are equal.



F-21.17 Horizontal Square Circle with $\frac{1}{4}$ roll, $\frac{1}{2}$ roll, $\frac{1}{2}$ roll, $\frac{1}{2}$ roll, $\frac{1}{4}$ roll



From upright perform a $\frac{1}{4}$ roll in the centre, push through a $\frac{1}{4}$ circle, perform a $\frac{1}{2}$ roll, pull through a $\frac{1}{4}$ circle, perform a $\frac{1}{2}$ roll, push through a $\frac{1}{4}$ circle, perform a $\frac{1}{2}$ roll, pull through a $\frac{1}{4}$ circle, perform a $\frac{1}{4}$ roll in the centre, exit upright.

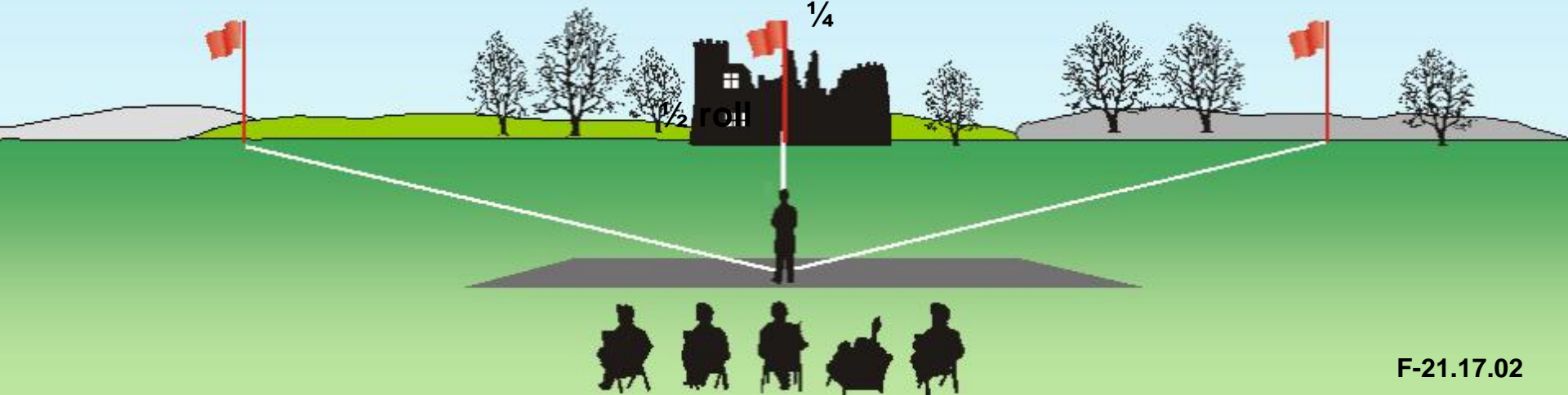
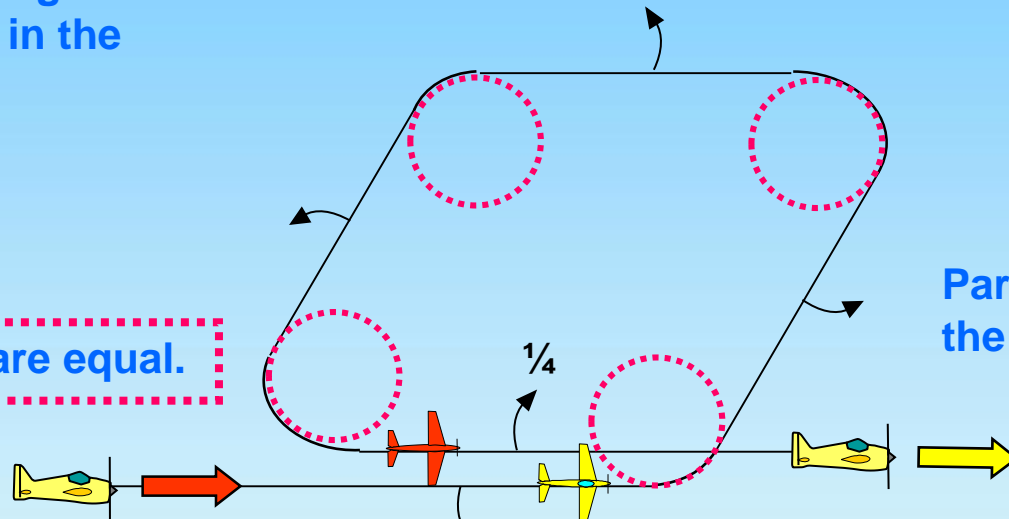
F-21.17 Horizontal Square Circle with $\frac{1}{4}$ roll, $\frac{1}{2}$ roll, $\frac{1}{2}$ roll, $\frac{1}{4}$ roll



During the knife-edge
the wing must be in the
vertical plane.

Radii of $\frac{1}{4}$ circles are equal.

Part rolls on middle of
the line.

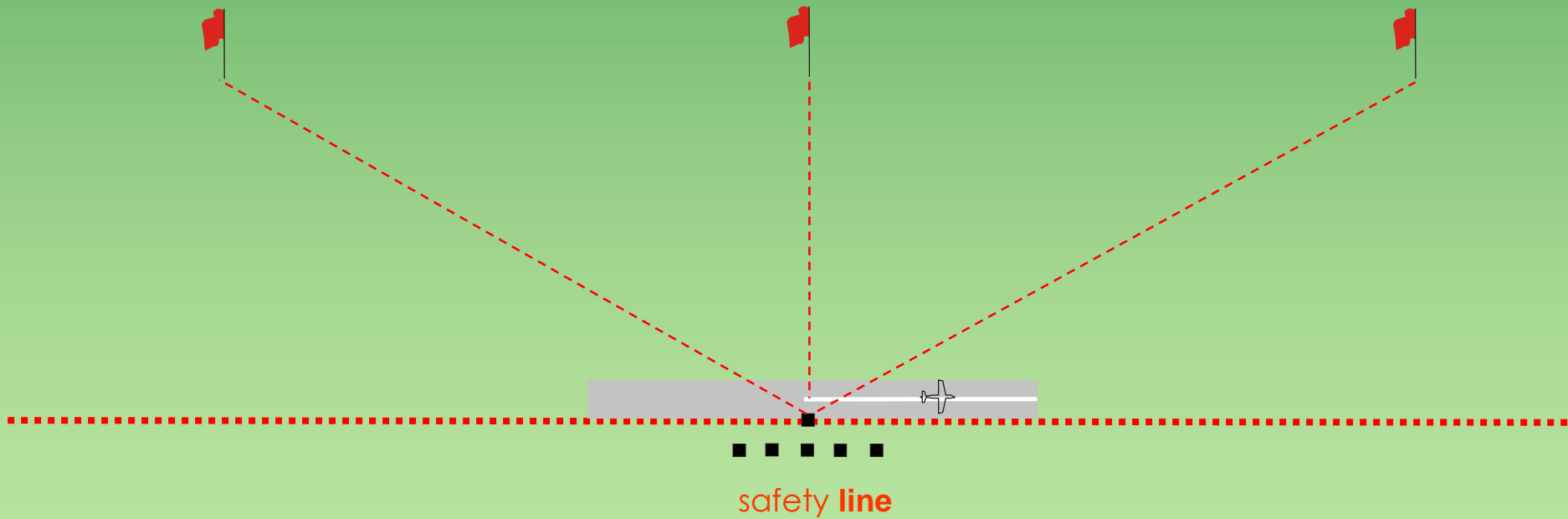




Landing procedure (not judged, not scored)

The direction of the landing may be different to the take off.

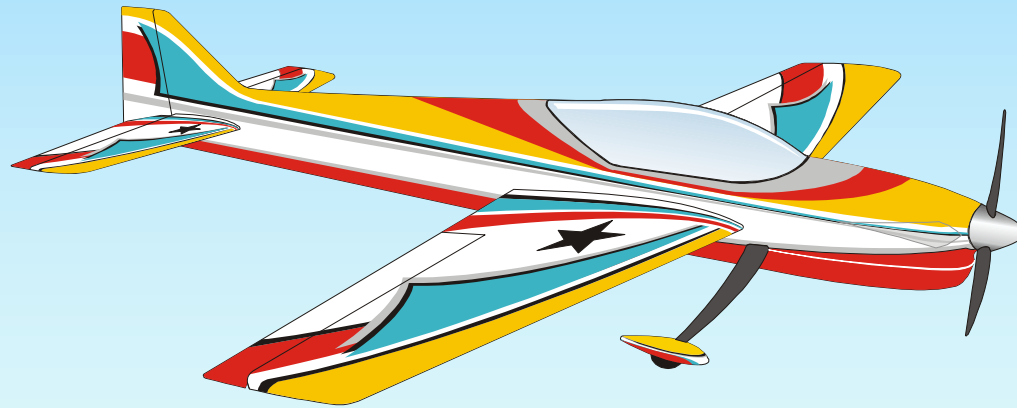
 **wind**



Forget **WHO** is flying
(friend, rival, countryman, flier from other nation)

Forget **WHAT** is flying
(2-stroke, 4-stroke, electric)

LOOK ONLY AT LINES DESCRIBED IN THE SKY!
(and the precision, smoothness, positioning, and size)



Thank you!

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