

ANNEX 5D**F3C MANOEUVRE DESCRIPTIONS AND DIAGRAMS**

The manoeuvre schedules are listed below with the starting and ending direction (UU = Upwind - Upwind; DD = Downwind - Downwind; DU = Downwind - Upwind; UD = Upwind - Downwind) of each manoeuvre, relative to the wind, as indicated. The competitor has 10 minutes to complete each schedule. Schedule P will be flown for the preliminary rounds 1 through 4. Schedule F will be flown for the Fly-Off rounds.

SCHEDULE P

P1. FIGURE "M" WITH HALF PIROUETTES.....	(UU)
P2. SEMI CIRCLE WITH PIROUETTE	(UU)
P3. DIAMOND 3	(UU)
(FLY BY)	
P4. CUBAN 8 WITH HALF 4 POINT ROLLS	(DD)
P5. PULLBACK WITH BACKWARD ROLL.....	(UU)
P6. COBRA ROLL WITH $\frac{3}{4}$ PUSHED FLIPS	(DD)
P7. CANDLE WITH TWO HALF ROLLS, HALF PUSHED FLIP.....	(UU)
P8. TWO OPPOSITE TWO POINT ROLLS	(DD)
P9. INSIDE LOOP WITH PIROUETTE	(UU)
(FLY BY)	
P10. AUTOROTATION WITH TWO 90° TURNS	(DU)

SCHEDULE F

F1. CIRCLE WITH 360° PIROUETTE	(UU)
F2. INVERTED TRIANGLE 2	(UU)
F3. OVAL 1	(UU)
(FLY BY)	
F4. CUBAN 8 WITH PUSHED FLIP	(DD)
F5. PULLBACK WITH 3 HALF LOOPS AND 2 TAIL TURNS.....	(UU)
F6. COBRA ROLL WITH PIROUETTE	(DD)
F7. TWO LOOPS WITH HALF ROLLS	(UU)
F8. PUSHED FLIP WITH HALF ROLLS	(DD)
F9. VERTICAL 540° FLIP.....	(UD)
(FLY BY)	
F10. "S" AUTOROTATION	(UU)

5D.1 General

The manoeuvres are displayed in pictorial form in Figures 5D-P and 5D-F for the case where the wind direction is left to right. The following descriptions apply to all manoeuvres and if not performed properly must result in downgrades. Points will also be subtracted if a manoeuvre is not performed as described. The starting/ending altitude for the hovering manoeuvres is 2m above the helipad. If a manoeuvre is unrecognisable it must be severely downgraded. If pirouettes are performed in the wrong direction, the score shall be zero (0) points. Ascents from, and descents to, the helipad must be vertical. Landings must be smooth and centred on the helipad. During the hovering manoeuvres all stops must be of 2 seconds minimum duration (unless specified otherwise). Circular and linear hovering segments must be performed at a constant speed. Every pirouette must be performed at a constant turning rate. The hovering manoeuvres must be started with the nose of the model aircraft (MA) facing left or right and must be flown as a unit (the starting heading must be same for each hovering manoeuvre). The competitor must stand in the 2m diameter circle marked "P" in Figure 5.4.A during all manoeuvres. All aerobatic manoeuvres must start and end in the direction indicated with a straight and level flight line of 10m minimum length. Entry and exit must be at the same altitude and heading. Loops or parts of a loop must be round and have the same diameter. Consecutive loops must be in the same location and plane. Rolls must be performed at a constant roll rate. Consecutive rolls must have the same roll rate and must be at the same altitude and heading. During all aerobatics manoeuvres the competitor must maintain his MA above a minimum altitude of 10 m. Aerobatic manoeuvres must be centred within the 120° horizontal field of view and must be symmetrical about the centre line. Aerobatic manoeuvres flown at a distance greater than 100m from the judges' line will be downgraded. In case of a dispute the following text takes precedence over Figures 5D-P and 5D-F.

5D.2 SCHEDULE P

P1. FIGURE “M” WITH HALF PIROUETTES – (UU)

The MA lifts off from the helipad and hovers at 2m. MA backs up, stops and hovers over flag 1(2). MA ascends 2.5m while performing a 180° pirouette and stops for 1 second, continues ascent while performing a 180° pirouette and stops at 5m. MA descends 2.5m at 45° while performing a 180° pirouette and stops for 1 second. MA continues 45° descent while performing a 180° pirouette and stops at 2m. MA ascends 2.5m at 45° while performing a 180° pirouette and stops for 1 second, continues ascent while performing a 180° pirouette and stops at 5m. MA descends 2.5m while performing a 180° pirouette and stops for 1 second, continues descent while performing a 180° pirouette and stops at 2m over flag 2(1). MA backs up 5m, stops and hovers over helipad. MA descends and lands on helipad. All 180° pirouettes may be performed in either direction.

P2. SEMI CIRCLE WITH PIROUETTE – (UU)

MA takes off vertically to 2m and stops. MA flies backward to flag 1(2) and stops. MA then performs a semi circle with 5m radius with a simultaneous full pirouette in either direction to 2m above flag 2(1) and stops. MA hovers backward to helipad and stops. MA descends to helipad and lands.

P3. DIAMOND 3 – (UU)

MA ascends vertically to 2m and stops. MA ascends backwards 2.5m in a straight line while simultaneously performing a 90° pirouette (nose to the pilot) and stops over flag 1(2). MA ascends sideways 2.5m in a straight line and stops over helipad. MA performs a 360° pirouette in either direction and stops. MA descends sideways 2.5m in a straight line and stops over flag 2(1). MA descends 2.5m in a straight line while simultaneously performing a 90° pirouette in opposite direction to the first one and stops at 2m over helipad. MA descends to helipad and lands.

P4. CUBAN 8 WITH HALF 4 POINT ROLLS – (DD)

MA flies straight and level for a minimum of 10m and performs a 5/8 inside loop. When MA is in 45° descent and inverted it performs a half 4 point roll (180° roll with hesitation at 90°) in either direction to upright and enters a ¾ inside loop. When the MA is again in 45° descent and inverted it performs a second half 4 point roll (180° roll with hesitation at 90°) in either direction and finishes the first partial loop in upright attitude. MA flies 10m straight and level exit.

P5. PULLBACK WITH BACKWARD ROLL – (UU)

MA flies straight and level for 10m and enters the manoeuvre by pulling up into a vertical ascent after passing the centre line. After MA comes to a stop the MA accelerates with a 90° pushed travelling flip to backward flight and performs a full backward roll at constant altitude. This is followed by another 90° pushed travelling flip to a vertical nose down stop. MA then continues by descending on a path that mirrors the entry path. After the descent, MA transitions to same heading and altitude as at the start of the manoeuvre. MA continues for 10m to finish the manoeuvre.

P6. COBRA ROLL WITH ¾ PUSHED FLIP – (DD)

MA flies straight and level for 10m and enters the manoeuvre by pulling up into a 45° climb. After a 5m minimum straight segment MA performs a half roll in either direction to the inverted position and continues to climb at 45° for 5m minimum. After MA comes to a stop MA makes a 270° pushed stationary flip before it enters a 45° dive and after a 5m minimum straight segment performs another half roll in either direction. MA continues for 5m minimum and then recovers at starting altitude in level flight for 10m to finish manoeuvre.

P7. CANDLE WITH TWO HALF ROLLS, HALF PUSHED FLIP – (UU)

MA flies straight and level for 10m and enters the manoeuvre by pulling up into a 5m (minimum) vertical ascent, followed by half roll and another 5m (minimum) ascent. MA performs a half pushed travelling flip such that the first half occurs during the ascent and the second half occurs during the descent. MA goes into a vertical 5m descent followed by a half roll and another 5m descent to same altitude as entry. MA continues for 10m to finish the manoeuvre.

Note: MA must be horizontal at the top.

P8. TWO OPPOSITE TWO POINT ROLLS – (DD)

MA flies straight and level for a minimum of 10m and performs a 180° roll and continues with 1 second inverted flight. MA performs a second 180° roll in same direction followed by 1 second upright flight. MA performs third 180° roll in opposite direction of first two and continues with 1 second inverted flight. MA performs fourth 180° roll in same direction as third 180° roll to upright flight. Manoeuvre is completed with 10m straight and level flight.

P9. INSIDE LOOP WITH PIROUETTE – (UU)

MA flies straight and level for 10m minimum entry. MA performs an inside loop with a travelling 360° pirouette on top with minimum duration of 2 seconds. The pirouette may be in either direction. Manoeuvre is completed with 10m straight and level flight.

P10. AUTOROTATION WITH TWO 90° TURNS – (DU)

MA flies at a minimum altitude of 20 m. Manoeuvre begins when MA crosses an imaginary plane that extends vertically upward from a line drawn from the centre judge out through the helipad. MA must be in the autorotation state when it cuts this plane. The engine power must be reduced to idle (or off) at this point and the MA must be descending. The first 90° turn must be made after the MA has made 1/3 of the total descent. After this turn the MA must fly straight before the next turn is made after the MA has made 2/3 of the descent. The MA then flies straight down to the helipad. Each leg of the manoeuvre must be a minimum of 10m in length. The descent rate must be constant from start to a point just before touchdown on the helipad. The flight path of the MA must appear as an open square when viewed from above, starting at the vertical plane and ending at a line drawn from the centre judge through the helipad. If the helicopter flies out of the 120° window during the second turn it shall not result in a downgrade of 2 points.

Scoring criteria for landing: See ANNEX 5E Paragraph 5E.6.10.

5D.3 SCHEDULE F**F1. CIRCLE WITH 360° PIROUETTE – (UU)**

MA takes off vertically from the helipad and ascends to 2m and stops. MA starts backwards into a 5m vertical circle while simultaneously performing a 360° pirouette in either direction. At the end of the vertical circle MA comes to a stop at 2m over helipad. MA then descends to a landing on the helipad.

F2. INVERTED TRIANGLE 2– (UU)

MA takes off vertically from helipad and stops at 2m. MA performs a 90° pirouette so nose points to the pilot. MA ascends at 45° while performing 180° pirouette in either direction and stops over flag 1(2). MA then flies horizontally to flag 2(1) while performing a 4 point pirouette and stops. (The stops between the points of 4-point pirouette are of 1 second duration.) MA descends at 45° while performing 180° pirouette in either direction and stops at 2m over helipad. Model then performs a 90° pirouette and stops. MA then descends to and lands on helipad.

F3. OVAL 1- (UU)

MA takes off vertically from helipad to 2m and stops. MA moves 2.5m backwards while performing 90° pirouette and continues into a half ascending vertical circle of 5m diameter while simultaneously performing a 180° pirouette in either direction. MA hovers sideways from one halfway line to the other with nose facing the pilot. MA continues into a half descending vertical circle while simultaneously performing a 180° pirouette in opposite direction to the first to the second half way line and then continues back while performing a 90° pirouette in the opposite direction to the first 90° pirouette to 2m over helipad and stops. MA descends to a landing on the helipad. (There are no stops during this manoeuvre except the two over the helipad).

F4. CUBAN 8 WITH PUSHED FLIP – (DD)

MA flies straight and level for a minimum of 10m and performs a 5/8 inside loop. When the MA is in first 45° descent and inverted it performs a full pushed travelling flip. MA continues with a ¾ outside loop. When MA is in second 45° descent it finishes the first partial loop in upright attitude. MA flies straight and level for a minimum of 10 m.

F5. PULLBACK WITH THREE HALF LOOPS AND TWO TAIL TURNS - (UU)

MA flies straight and level for a minimum of 10m. MA enters vertical ascent and stops and performs a small backward half inside loop followed by a 180° tail turn. MA performs a small backward half outside loop followed by a 180° tail turn. MA performs a small backward half inside loop and stops. MA then descends vertically to same altitude as entry and finishes by flying straight and level for 10m.

F6. COBRA ROLL WITH PIROUETTE – (DD)

MA flies straight and level for a minimum of 10 m. MA pulls up to establish a 45° line. MA then performs a 180° roll to inverted and continues to the apex. At apex MA performs a 135° pushed stationary flip followed by a slow (4 seconds minimum) 360° pirouette followed by a second 135° pushed stationary flip. MA then enters a 45° descent with a centred 180° roll back to the same altitude as at entry. MA finishes manoeuvre with straight and level flight of 10m minimum.

F7. TWO LOOPS WITH HALF ROLLS – (UU)

MA flies straight and level for a minimum of 10m. MA flies a half loop with a half roll on top, continues with a full outside loop followed by a half roll and half inside loop. The two half rolls must be included in the loop paths. (The two half rolls must be included in the loop paths such that MA is in knife edge flight at the top of the loops). MA finishes manoeuvre with a straight and level flight of 10m minimum.

F8. PUSHED FLIP WITH HALF ROLLS – (DD)

MA flies straight and level for a minimum of 10m. MA performs a 180° roll to 1 second duration inverted flight. MA then performs a travelling, full pushed flip followed by 1 second inverted flight. MA then performs a second 180° roll to upright and finishes the manoeuvre with 10m straight and level flight.

F9. VERTICAL 540° FLIP – (UD)

MA flies straight and level for a minimum of 10m. MA then enters a centred vertical climb and performs a 540° pushed travelling flip. Half (270°) of the pushed travelling flip is performed during the ascent and the second half is performed during the descent. MA must be horizontal and inverted at the top. MA then descends vertically 5m (minimum), performs a 180° roll followed by another 5m (minimum), 90° inside loop back to entry altitude and opposite heading. MA finishes manoeuvre with 10m minimum straight and level flight.

F10. “S” AUTOROTATION– (UDU)

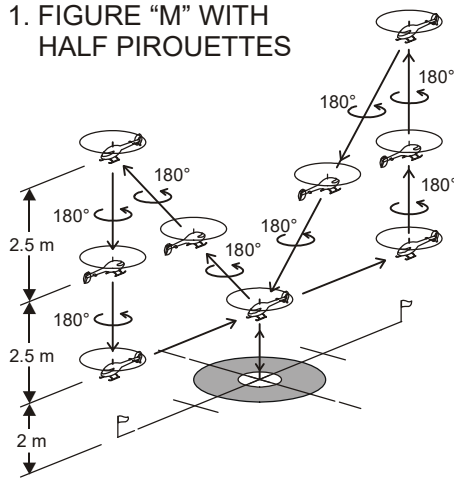
MA enters the manoeuvre going upwind at a minimum altitude of 40m and some distance out. Before crossing the centre plane upwind the MA must be in the auto rotation state, the engine power must be reduced to idle (or off) at this point and the MA must be descending. MA then makes the first 180° turn towards the pilot. As MA crosses the centre plane again but downwind it enters another descending 180° turn toward the pilot and lands upwind.

Scoring criteria for landing: See ANNEX 5E Paragraph 5E.6.10.

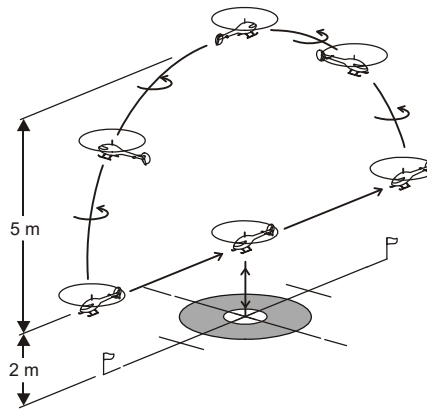
Note: Manoeuvre diagrams are overleaf.

FIGURE 5D-P: F3C MANOEUVRE SCHEDULE P

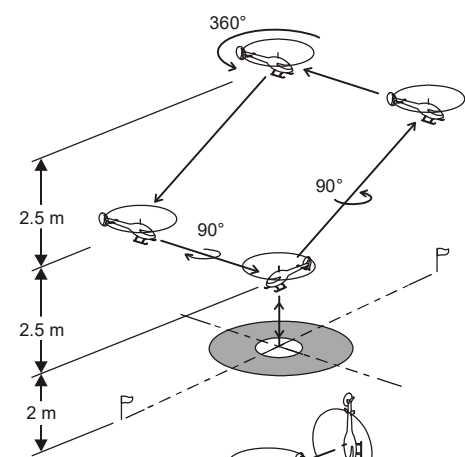
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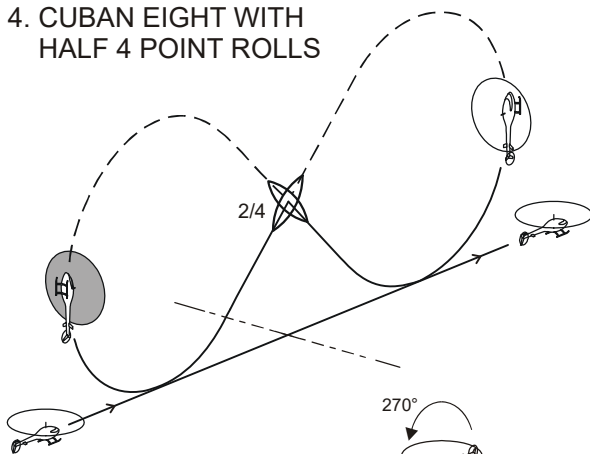
2. SEMI CIRCLE WITH PIROUETTE



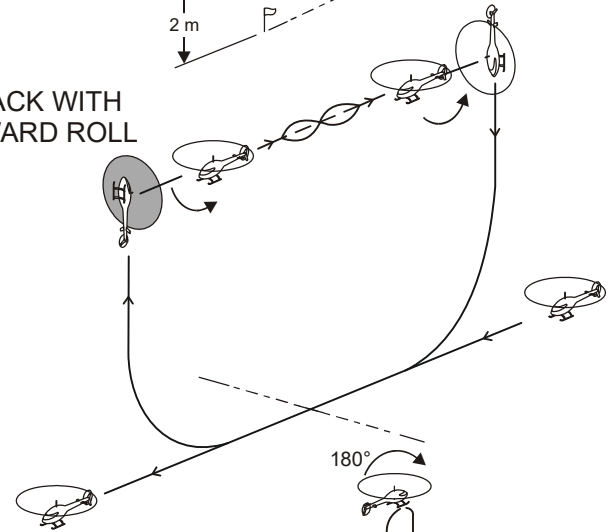
3. DIAMOND 3



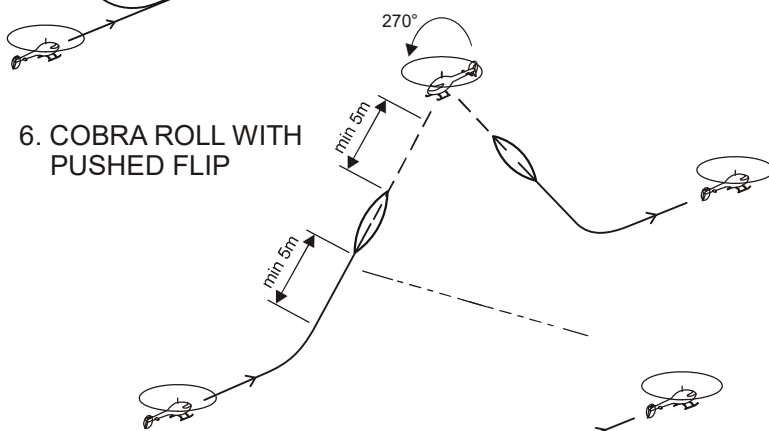
4. CUBAN EIGHT WITH HALF 4 POINT ROLLS



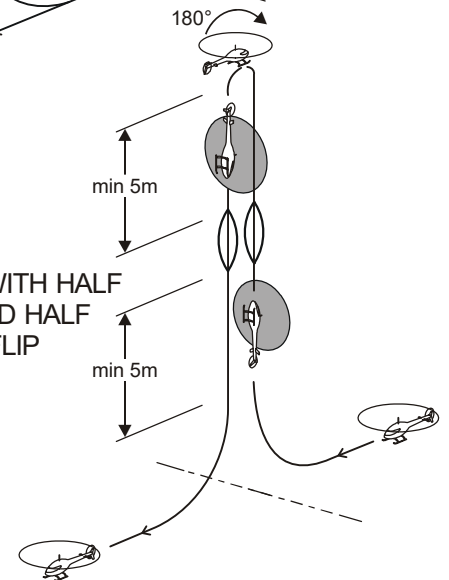
5. PULLBACK WITH BACKWARD ROLL



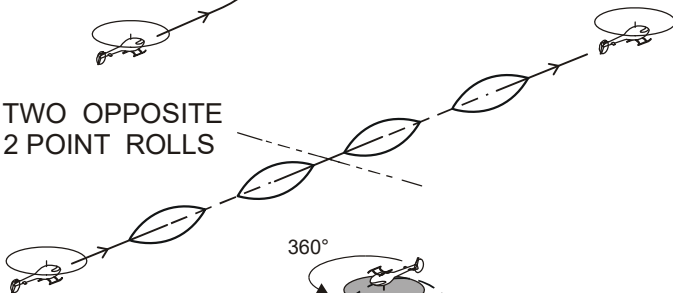
6. COBRA ROLL WITH PUSHED FLIP



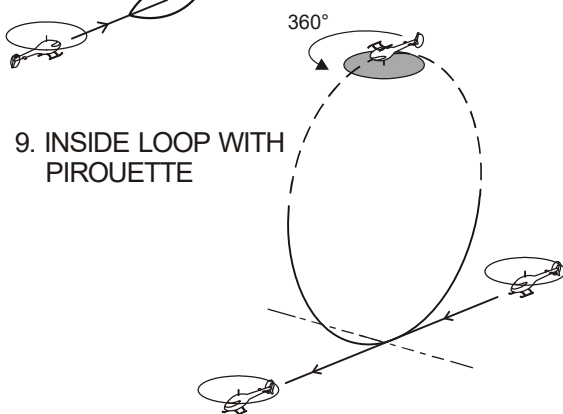
7. CANDLE WITH HALF ROLLS AND HALF PUSHED FLIP



8. TWO OPPOSITE 2 POINT ROLLS



9. INSIDE LOOP WITH PIROUETTE



10. AUTOROTATION WITH TWO 90° TURNS

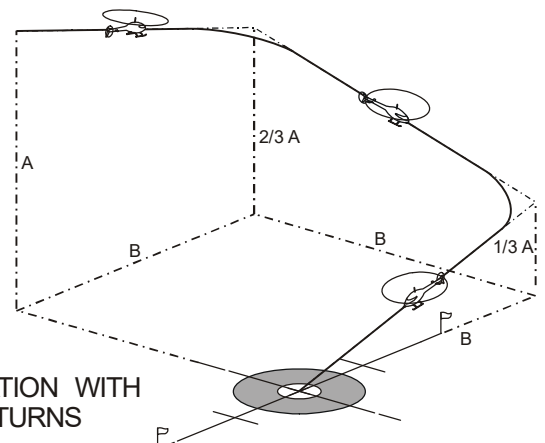


FIGURE 5D-F: F3C MANOEUVRE SCHEDULE F

