

ANNEX 5F**F3N MANOEUVRE DESCRIPTIONS AND DIAGRAMS****5F.1 F3N SET MANOEUVRE DESCRIPTIONS**

- (a) The list of Set Manoeuvres contains 30 manoeuvres from the list below and ten optional manoeuvres. The optional manoeuvres must be selected by the organiser at least 6 months prior to the competition from a list that is available from the F3 Helicopter Subcommittee Chairman. This list will be revised by the F3 Helicopter Subcommittee on a yearly basis and will be approved by the CIAM Bureau.
- (b) The competitor or his caller must announce the name and start and finish of each manoeuvre. All aerobatic manoeuvres start and end with a straight and level flight of 10 metres minimum length parallel to the judges' line. All manoeuvres from stationary flight start and end with a hovering of at least 1 second with the MA parallel or vertical to the flight line. All manoeuvres (considering also entry and exit) should be performed symmetrical to the centre line. If the engine is running during the autorotation there will be a downgrade of 4 points by each judge. If the engine is still running during the landing after an autorotation the score will be zero. The drawings in paragraph 5.11.12 illustrate the manoeuvres, in case of a dispute the following text takes precedence over the drawings. All manoeuvres can also be flown in opposite direction to that shown in the drawings.

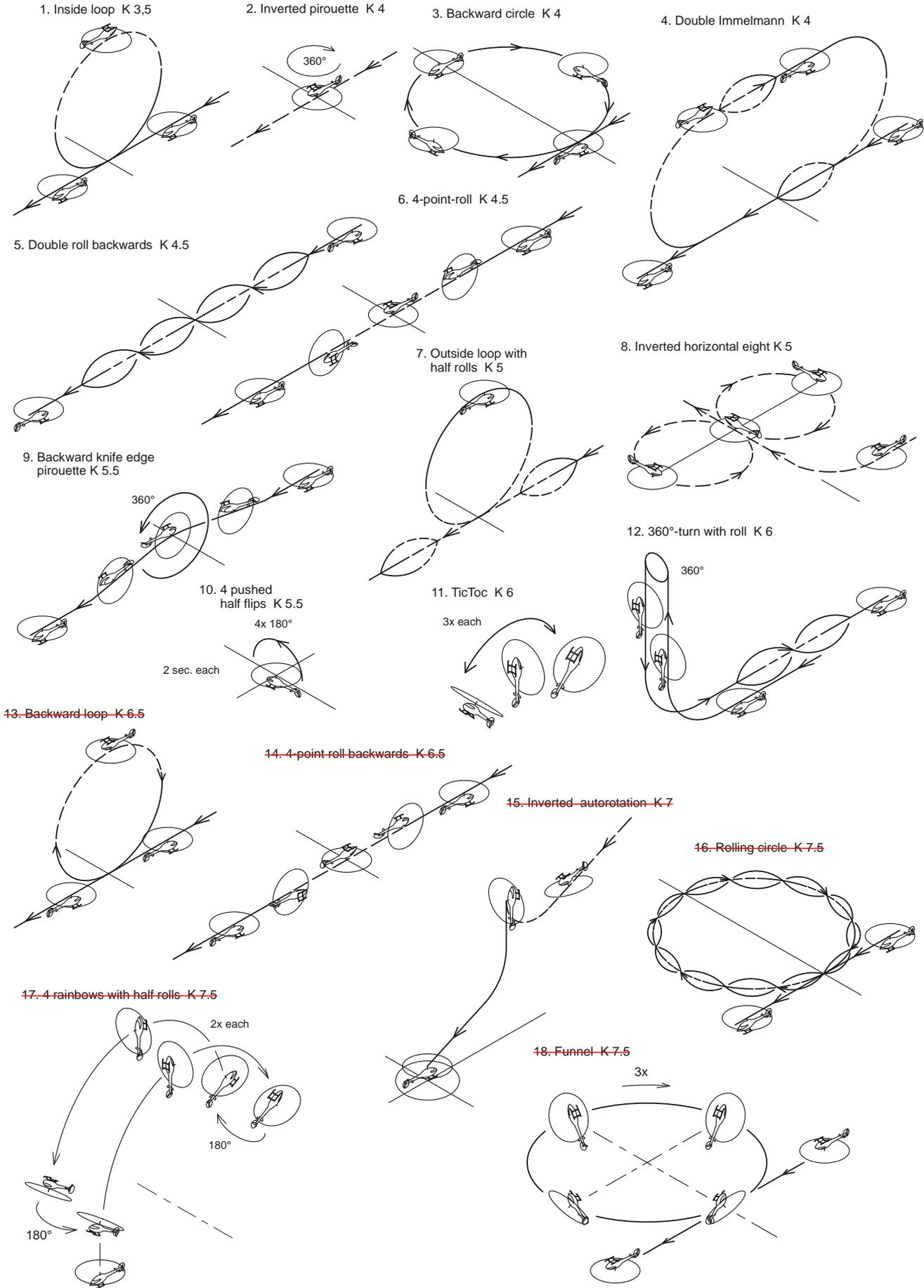
Number	Description	K-Factor
1.1	Inside loop MA performs an inside loop.	3.5
1.2	Inverted pirouette MA hovers in inverted flight and performs a slow (at least 4 seconds) 360°-pirouette, maintaining its lateral position.	4.0
1.3	Backward circle MA enters the manoeuvre backwards in upright flight and performs a horizontal circle aligned to the centre line.	4.0
1.4.	Double Immelmann MA performs a half inside loop immediately followed by a half roll to upright flight. After a straight flight of about 20 metres MA performs a half outside loop, again immediately followed by a half roll to upright flight.	4.0
1.5	Double roll backwards MA enters in upright backward flight and performs two consecutive axial rolls.	4.5
1.6	4-point roll MA enters in upright forward flight and then performs 4 quarter rolls, separated each by a recognisable straight segment of the same duration.	4.5
1.7	Outside loop with half rolls MA performs a half roll to inverted flight, followed by a recognisable straight segment and then enters an outside loop (upward). After the loop, MA flies another recognisable straight segment, followed by a half roll to upright flight.	5.0
1.8	Inverted horizontal eight MA enters in inverted forward flight parallel to the judges' line, performs a 90°-turn to a straight flight above the centre line and then performs a horizontal eight, consisting of two 360° circles.	5.0
1.9	Backward knife edge pirouette MA enters in upright backward flight, transitions to a slight ascent (max 15°) and performs a quarter roll. After a recognisable straight segment MA performs a 360°-pirouette, followed by another straight segment and a quarter roll in opposite direction to the first to upright backward flight.	5.5
1.10	Four pushed half flips MA hovers in upright position, then performs four half pushed flips (forward) each separated by a hovering of 2 seconds. MA maintains its position during the manoeuvre.	5.5
1.11	Tic-toc (Metronome) MA hovers and then is rotated (Nose up) about 135°. It then starts rotating alternately about the lateral axis by about 90° forward or backward. Both 45° positions have to be reached at least three times. The tail rotor stays almost in the same position during the manoeuvre.	6.0

Number	Description	K-Factor
1.12	360°-turn with roll MA enters in upright forward flight and performs a quarter (inside) loop to a vertical climb. Just before the stall, MA performs a 360°-pirouette to a vertical (backward) dive, followed by another quarter (inside) loop to upright flight and an axial backward roll.	6.0
1.13	Backward loop MA enters in upright backward flight and performs an inside loop with the tail always pointing in flight direction.	6.5
1.14	4-point roll backwards MA enters in upright backward flight and then performs 4 quarter rolls, separated each by a recognisable straight segment of the same duration. The tail of the MA always points in the flight direction.	6.5
1.15	Inverted autorotation MA enters in an altitude of at least 30 metres in inverted flight. The engine must be off and the MA descends in the inverted autorotative state for about 5 seconds. Then it is brought to upright position, either by a half roll or a flip and descends to a smooth landing on the helipad.	7.0
1.16	Rolling circle MA performs a horizontal circle while it performs consecutive axial rolls. MA speed, rolling rate and the radius of the circle should be constant.	7.5
1.17	4 rainbows with half rolls MA performs a rainbow (a semicircle with the lateral axis always vertical to the flight path) to a recognisable stop, then a stationary half roll to another stop. Then it enters another rainbow to a stop on the position of the start of the manoeuvre, followed by another half roll and continues like that, until four rainbows and four half rolls are completed.	7.5
1.18	Funnel MA enters in inverted flight and performs a quarter pirouette. MA then performs three superimposed circles in lateral inverted flight with the rotor disk tilt at least 45 degree from a horizontal plane. The diameter of the circles should be at least 10 metres.	7.5
1.19	Snake MA enters in upright backward flight and then describes a sinuous line by alternately performing upright and inverted circle segments of equal diameter and length. There should be at least four complete circle segments and the length of the manoeuvre should be at least 50 metres.	8.0
1.20	Triple pirouetting flip MA hovers and then starts pirouetting. At the same time or after one pirouette the MA starts to flip three times while it continues to perform pirouettes. There should be at least one pirouette during each 360° flip (2 pirouettes are shown in the drawing). Both rotations should have a constant rate and the MA maintains its position during the manoeuvre.	8.0
1.21	Cuban eight backwards MA enters in upright backward flight and performs a 5/8 inside loop to a 45° descent. It performs a half roll, followed by a 3/4 inside loop and another half roll in 45° descent. MA then finishes the first partial loop to upright backward flight. The tail of the MA always points in the flight direction.	8.0
1.22	Pirouetting loop MA enters in upright flight and starts performing pirouettes. Then it performs an inside loop while constantly rotating about the yaw axis. During the loop there have to be at least 2, max 6 pirouettes. The pirouettes should be distributed equal on the loop.	8.5
1.23	Backward rolling circle MA enters in backward flight and performs a horizontal circle while it performs consecutive axial rolls. MA speed, rolling rate and the radius of the circle should be constant and the tail of the MA always points in the flight direction.	8.5
1.24	Diamond (Bavarian rhomb) MA enters in upright forward flight and over the centre line it performs a 45° pushed flip and enters a 45° climb of at least 20 metres length. After a pushed 90° flip it climbs for another 20 metres under 45° back to the centre line where it performs another quarter pushed flip. It descends under 45° to another quarter pushed flip and a final descend back to the centre line and then exits the manoeuvre in upright flight. During the 45° ascends/ descends the longitudinal axis of the MA should be almost perpendicular to the flight path.	8.5

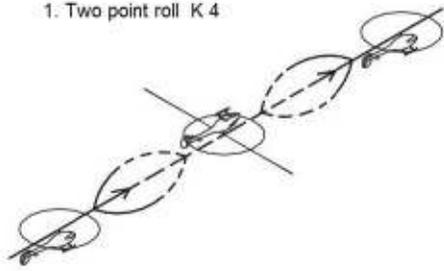
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5F.2 SET MANOEUVRE DRAWINGS

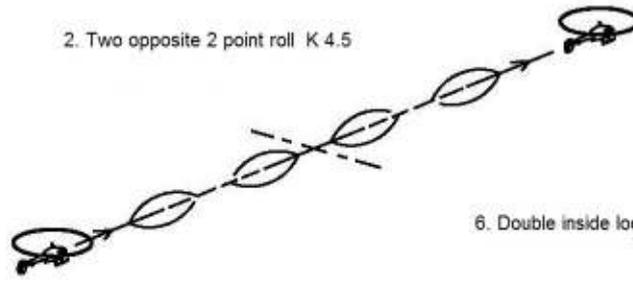
Set Manoeuvres 1 – 18 (of 30)



1. Two point roll K 4



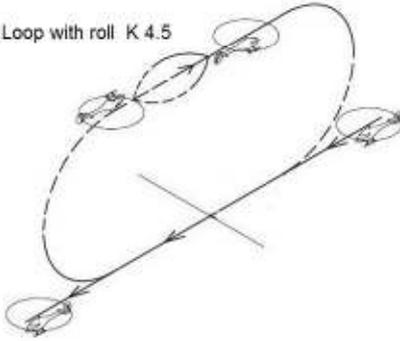
2. Two opposite 2 point roll K 4.5



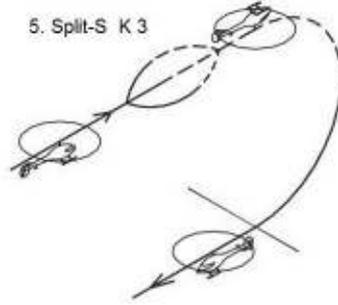
3. Flip forward K 4.5



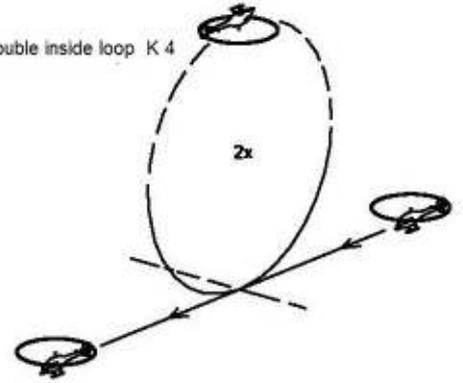
4. Loop with roll K 4.5



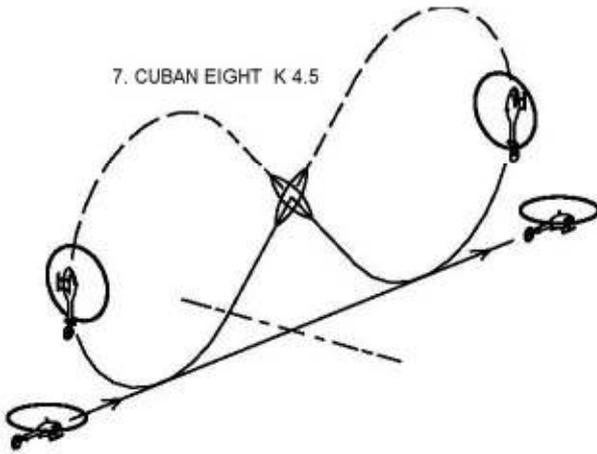
5. Split-S K 3



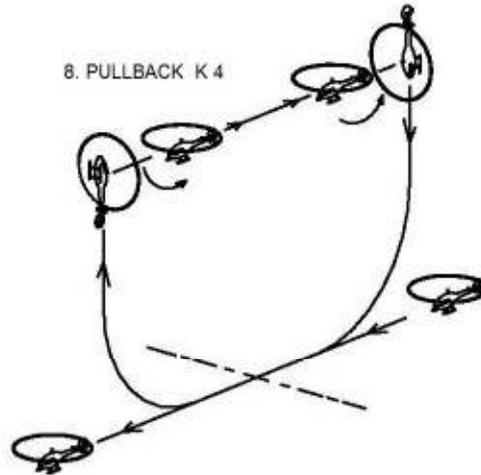
6. Double inside loop K 4



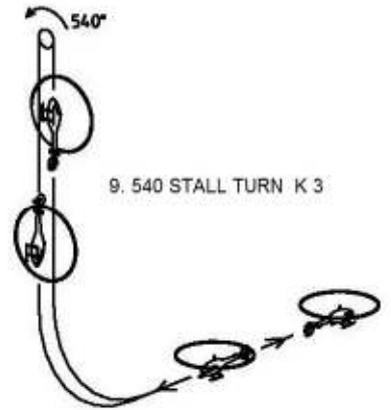
7. CUBAN EIGHT K 4.5



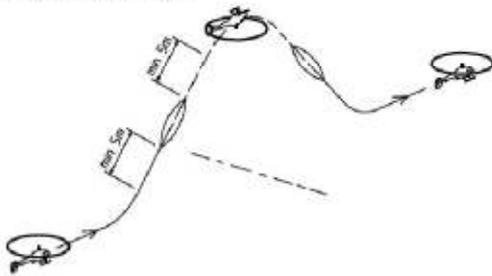
8. PULLBACK K 4



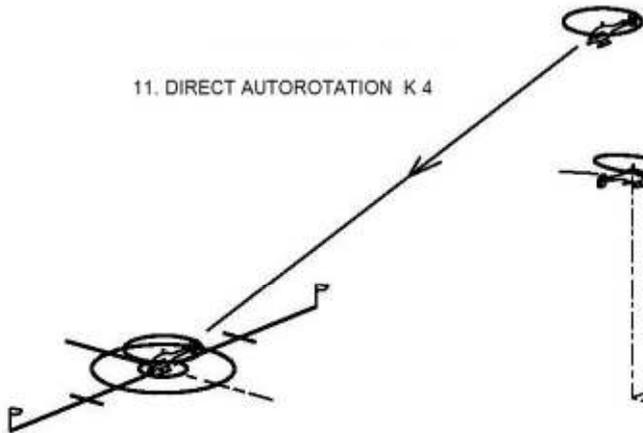
9. 540 STALL TURN K 3



10. COBRA ROLL K 4.5



11. DIRECT AUTOROTATION K 4



12. AUTOROTATION 180 K 5

