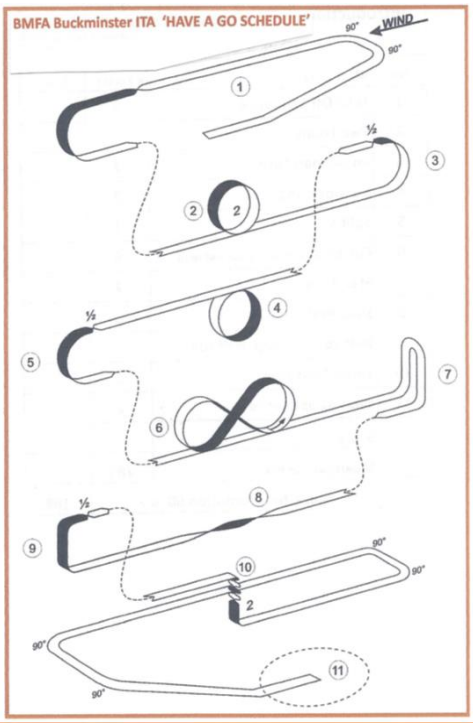
Introduction to Aerobatics BMFA Buckminster

HAVE A GO MANOEUVRES			Tick
No	Manoeuvre	Difficulty	Progress
1	Take Off Sequence	2	
2	Two Loops	4	
3	Immelman Turn	2	
4	Outside Loop	2	
5	Split S	1	
6	Cuban 8 (with or without half rolls)	5	
7	Stall Turn	2	
8	Slow Roll	3	
9	Half Square Loop Half roll	3	
10	Two or Three Turn Spin	2	
11	Landing Sequence	2	

If each manoeuvre is marked out of 10 and multiplied by the difficulty factor, a good standard total is 168.
(60% of the possible total of 280)



A reminder that all manoeuvres should be practiced as individual figures before it is attempted to put them into a sequence. Turn round manoeuvres usually take a pilot out of their comfort zone and can be disorientating. It needs practice at a safe height.

M1 Take-off Sequence:

Your take off is all about discipline to set the scene for the rest of the flight. Do not rush to turn away onto cross wind leg after take-off. Any obvious trimming of the model can be made when the take-off procedure is thought about before preparing your model for flight and you should be relaxed.

There are two recognised take off procedures:

a. *The race trace take off is maybe the most familiar. This starts with the model at rest of the runway facing into wind. The throttle is applied slowly until the model moves forward, gradually gaining speed until it is safe to lift of and fly in a straight line away from the pilot gradually gaining height at about a 30° angle.*
When at a safe height turn through a 180° turn onto the down wind leg. As the model passes the centre line of the manoeuvring box it should be flying at your chosen bottom line height. If in competition the judging would stop at this point and any manoeuvre can follow for your into wind straight line flight to start the first manoeuvre. A turnaround manoeuvre like a Half Cuban eight will keep at the same distance or you may use another 180° turn to bring the model nearer to you.

b. *The alternative is to fly the first part of the take-off sequence as in example (a) but after gaining height on the initial take off let the model fly further into wind and perform two 90 ° turns. The first onto a cross wind leg, the model may still be gaining height but should be kept straight and then another 90 ° turn onto the downwind leg. After passing the centre line any manoeuvre can be performed to approach you first manoeuvre on the centre line of the manoeuvring area. Importantly this take-off sequence will allow you time to trim your model in level flight on three occasions, the first straight after take-off, the second in the straight flight on the crosswind leg and then again on the longer downwind leg.*

Judging notes.

- Any deviation from the notes above.
- The climb out should be at a constant angle until the bottom line height is reached and then level flight should be maintained until the model passes the centre line of the manoeuvring area.

M2 Two inside Loops:

From upright on the baseline at the centre line pull through two inside loops to exit upright at baseline height.

This manoeuvre is intended to teach how important it is to exit the last manoeuvre in the right place. The first loop must finish near the expected position to allow a good entry into the second loop which should be superimposed on the first loop. Do not make the loops too big as to allow your model to lose speed and control authority over the top of the loops.

Judging notes.

- Loops to be concentric and of equal size.
- Constant radius.
- Entry and exit should be same height.

M3 Immelmann Turn with Half Roll:

From upright pull into a half loop and immediately perform a half roll to exit upright.

Again, do not make this manoeuvre too big so the model loses speed and control authority at the top of the half loop. After the half loop gain speed in order to perform the half roll after flying a very short straight line.

Judging notes.

- Constant radius through half loop.
- Half roll should immediately follow half loop.

M4 One Outside Loop:

From upright on the top line at the centre line push through one outside loop to exit upright at baseline height.

Positioning after the last manoeuvre is vitally important. Make sue you perform the Immelmann turn as far up[wind as you are comfortable with. There needs to be a straight line after the Half Roll to ready yourself to push for the outside loop on the centre line.

Judging notes.

- Loops to be concentric and of equal size.
- Constant radius.
- Entry and exit should be same height.

M5 Split S:

From upright on the top line perform a half roll immediately followed by half an inside loop to exit upright on the baseline.

Make sure you finish the last manoeuvre high enough not to put the model in danger after the half roll when you pull to perform the half inside loop immediately after the half roll.

Judging notes.

- Half loop immediately follows the half roll.
- Constant radius through half loop.

M6 Cuban Eight with no or without Half Rolls: (Decide which before take-off)

From upright on the baseline fly past centre and pull through ⅝ of an inside loop into a 45° down line. Push through ¾ of an outside loop into a 45° down line. Pull through a 1/8 loop to exit upright on the baseline.

At first sight it appears that completing this manoeuvre with half rolls in the 45° down lines is the easiest, however if rolls are flown, they should be performed in the middle of the 45° down lines and on the centre line of the manoeuvring area.

Some pilots may feel it is better to concentrate on applying down elevator after the 5/8 loop to complete a straight 45 down line centred on the centre line of the manoeuvring bare.

Judging notes.

- All radii equal.
- Entry and exit should be same height.
- Crossover on 45 degrees down lines must be over centre line.
- If rolls are performed, they should be centred on the centre line of the manoeuvring area.

M7 Stall Turn:

From upright on the baseline pull through a ¼ loop into a vertical up line, followed by a stall turn into a vertical down line. Pull through a ¼ loop to exit upright.

Proceed as far up wind as the manoeuvring area and the size of your model allows. The model should stop at the top of the upline and rotate around the C of G. No marks would be lost due to drift during or after the rotation. Down elevator needs to be applied to keep the model at the same distance from the pilot on the way down. Ant tail wagging after the stall is due to the elevator being released too quickly.

Judging notes.

- If the stall turn is between half and 1 wing span then minus 1 point.
- If the stall turn is between 1 wing span and a 1.5 wing spans then minus 2/3 points.
- If the stall turn is between 1.5 wing spans and a 2 wing spans then minus 4/5 points.
- If the stall turn is greater than 2 wing spans then minus 10 points.
- If the aircraft exhibits a pendulum effect after exiting the stall turn then minus 1 point.

M8 Slow Roll:

From upright on the baseline perform a slow roll to exit upright on the baseline.

This manoeuvre relies on the model being at the end of the manoeuvring area before attempting to prepare for the slow roll across the centre line..

Judging notes.

- Constant roll rate.
- Roll should take 3 to 5 seconds as a guide
- Model should be inverted on centre line.

M9 Half Square Loop, Half Roll, on exit:

From upright on the baseline pull through a ¼ loop into a vertical up line. Pull through a ¼ loop followed by a half roll to exit up right on the top line.

Do not make the upline too high as to allow the model to lose control authority. The short straight line after the up line is to allow the model to gain speed before ½ roll but be high enough to start the spin without losing too much hight and putting the model in danger.

Judging notes.

- Both radii equal.
- There should be a short pause between ¼ loop and half roll.

M10 Two or Three Turn Spin: (Decide which before take-off)

From upright on the top line, on the centre line of the box perform two (or three) consecutive spins followed by a vertical down line. At the bottom of the vertical down line, pull through a ¼ loop followed by a well-defined, straight line to exit upright on the baseline.

If too much hight was lost in the last manoeuvre abort the spin, do not put your model in danger by running out of hight.

Judging notes.

- Climbing on entry into spin, downgrade 1 point per 15 degrees.
- Yawing before entry into spin, downgrade 1 point per 15 degrees.
- Snap-roll entry, zero points.
- Forced entry, severe downgrade.
- Spin under or over rotation, downgrade 1 point per 15 degrees.

M11 Landing Sequence

As with take-off there are two ways this can be done: Decide before you take off.

a. *After the last manoeuvre, complete a 180° turn onto the downwind leg flying parallel to the runway, gradually loosing height, then at the downwind end of the manoeuvring area perform a 180° degree turn gradually losing height on to the landing area to land in front of the pilot.*
b. *After getting established on the downwind leg after the last manoeuvre, continue down wind for a safe distance and perform two 90° turns. The first onto base leg holding a straight but loosing height and then a further 90° turn on the landing approach to land in front of the pilot.*

Be careful about the distance flown at the down wind end to start your landing approach as distances can be deceiving and a small model may well soon get pushed beyond a safe distance.

Judging notes.

- Any deviation from the set procedure.
- Lines not flown at a constant angle of climb or not straight.

Ribbon diagram. Drawn by Alan Simmonds 2002