Text for reworked Annex 5A

Annex 5G UNKNOWN MANOEUVRE SCHEDULE FOR FFINAL FLIGHTS

ANNEX 5G
F3A RADIO CONTROLLED AEROBATIC MODEL AIRCRAFT
UNKNOWN MANOEUVRE SCHEDULES FOR FINAL FLIGHTS

5G.1. Unknown manoeuvre schedules shall be used in two of the three final flights for World or Continental Championships and shall be composed by Subcommittee approved computer software.

The link to Subcommittee approved computer Software will be published on FAI/CIAM F3 Aerobatic website.

The composition of any unknown schedule shall be completed no less than 12 hours before the commencement of finals flights for unknown schedules.

5G.2. Three unknown schedules will be generated for each required unknown schedule, by the contest director, in the presence of the FAI Jury members in advance of the Finals. The unknown schedules must be kept secret. At the Team Managers meeting, a random draw by the contest director will select the required number of unknown schedules.

The nominated and selected manoeuvres must conform to the following general criteria:

1. 17 manoeuvres per schedule:
   a) 9 Centre Manoeuvres (“CM”) : 5 upwind and 4 downwind.
   b) 8 Turn-around Manoeuvres (“TM”): 4 left and 4 right.
2. CM groups are numerical (1, 2, 3, …). TM groups are alphabetical (A, B, C, …)
3. The entry of one manoeuvre must match the exit of the previous manoeuvre, for entry level, entry attitude (level upright or level inverted flight), size of manoeuvres (wide as in a horizontal eight or narrow as in a stall turn) and direction of flight.
4. No duplication of centre manoeuvres from the same manoeuvre group with the exclusion of group 23 (rolls) manoeuvres: more than one manoeuvre from group 23 is allowed, but not two of the same manoeuvre with only the entry changed.
5. Maximum of two turnaround manoeuvres (TM) from each group per schedule
6. Spins are entered into the wind.
7. Minimum one manoeuvre of group 19 (CM spins) or G (TM spins), and 20 (CM stall turns) or H (TM stall turns), and 22 (rolling circles), and 23 (rolls).
8. Three manoeuvres of each schedule must have K = 6.
9. Five manoeuvres of each schedule must have K = 5.
10. The summary of K-factors must be at least 72.

The end of the last manoeuvre of the unknown sequences must be defined clearly during the Team Managers meeting before the Final.

5G.3. Once an unknown schedule has been composed and checked for correctness and the exact end of the last manoeuvre defined, it must receive the final approval of the Jury and the contest director. Printed copies, showing the Aresti pictograms and manoeuvre lists**,** shall then be distributed to team managers, finalists, judges, jury members, scorekeepers and non-finalists who are scheduled to perform warm-up flights. A sufficient number shall be made available by the organisers for spectators.

5G.4. After the composition of the unknown schedules, the judges shall receive instructions covering the unknown manoeuvres to ensure that they are fully aware of the sequence of manoeuvres..

5G.5 Aresti drawings of the unknown schedules must be provided to finalists and judges.

5G.6. Finalists may not attempt practice flights of an unknown schedule between its composition and the finals flights either with a model aircraft or via electronic flight simulator. Evidence of such practice shall be deemed cheating and shall lead to disqualification from the championships. Hand-held stick models are permitted..

5G.7 In addition to the warm-up flight for the finals known schedule, at least two warm-up flights must be arranged for the unknown schedule. The unknown warm-up flights may be observed by the finalists and must be judged. Under no circumstances should the flight scores of any warm-up flights be tabulated..

5G.8 List of Manoeuvre for composition of Unknown schedules. All manoeuvre drawings can be viewed by a link on FAI/CIAM F3 Aerobatic website.

5G.8.1 Centre manoeuvres

01.1 Rolling loop with one roll (from bottom) (K5)

01.2 Rolling loop with one roll (from bottom) inverted entry (K5)

01.3 Loop with 8-point roll (from bottom) (K5)

01.4 Loop with 8-point roll (from bottom) inverted entry (K5)

01.5 Loop with 4-point roll (from bottom) (K5)

01.6 Loop with 4-point roll (from bottom) inverted entry (K5)

01.7 Knife-edge loop (K6)

01.8 Knife-edge loop, inverted entry and exit (K6)

01.9 Knife-edge loop from top (K6)

01.10 Knife-edge loop from top, inverted entry and exit (K6)

01.11 Knife-edge loop with snap roll on top (K6)

01.12 Knife-edge loop with snap roll on top, inverted entry and exit (K6)

02.1 Two loops with half rolls at top (from bottom) (K3)

02.2 Two loops with half rolls at top (from bottom) inverted entry (K4)

02.3 Two loops with half rolls at bottom (from top) (K4)

02.4 Two loops with half rolls at bottom (from top) inverted entry (K3)

02.5 Two loops with full roll first top, half roll second (from bottom) (K4)

02.6 Two loops with full roll first top, half roll second, inverted entry (from bottom) (K4)

02.7 Two loops with half roll first top, full roll second (from bottom) (K4)

02.8 Two loops with half roll first top, full roll second, inverted entry (from bottom) (K4)

02.9 Two loops with full roll first bottom, half roll second (from top) (K4)

02.10 Two loops with full roll first bottom, half roll second (from top) inverted entry (K4)

02.11 Two loops with half roll first bottom, full roll second (from top) (K4)

02.12 Two loops with half roll first bottom, full roll second (from top) inverted entry (K4)

03.1 Avalanche with full snap (from bottom) (K3)

03.2 Avalanche with full snap (from bottom) inverted entry (K3)

03.3 Avalanche with 1 1/2 snap (from bottom) (K4)

03.4 Avalanche with 1 1/2 snap, inverted entry (from bottom) (K4)

03.5 Avalanche with 1 negative snap (from top) (K4)

03.6 Avalanche with 1 positive snap (from top) inverted entry (K3)

04.1 Triangular loop with full roll (from bottom) (K4)

04.2 Triangular loop with full roll (from bottom) inverted entry (K4)

04.3 Triangular loop with 2/2pt roll (from bottom) (K4)

04.4 Triangular loop with 2/2pt roll (from bottom) inverted entry (K4)

04.5 Triangular loop with 2/4pt roll (from bottom) (K4)

04.6 Triangular loop with 2/4pt roll (from bottom) inverted entry (K4)

04.7 Triangular loop with snap roll (from bottom) (K4)

04.8 Triangular loop with snap roll (from bottom) inverted entry (K4)

04.9 Triangular loop with 1 1/2 snap roll (from bottom) (K4)

04.10 Triangular loop with 1 1/2 snap roll (from bottom) inverted entry (K4)

04.11 Triangular loop with 1/2 rolls (from bottom) (K3)

04.12 Triangular loop with 1/2 rolls (from bottom) inverted entry (K3)

04.13 Triangular loop (base at bottom) with half rolls in 45 degree legs (K3)

04.14 Triangular loop (base at bottom) with half rolls in 45 degree legs, inverted entry (K3)

04.15 Triangular loop (base at bottom) with 2/4pt rolls in 45 degree legs (K4)

04.16 Triangular loop (base at bottom) with 2/4pt rolls in 45 degree legs, inverted entry (K4)

04.17 Triangular loop (base at bottom) with 2/2pt rolls in 45 degree legs (K4)

04.18 Triangular loop (base at bottom) with 2/2pt rolls in 45 degree legs, inverted entry (K4)

04.19 Triangular loop from top (base at top) with half rolls in 45 degree legs (K4)

04.20 Triangular loop from top (base at top) with half rolls in 45 degree legs, inverted entry (K4)

04.21 Triangular loop from top (base at top) with 2/4pt rolls in 45 degree legs (K4)

04.22 Triangular loop from top (base at top) with 2/4pt rolls in 45 degree legs, inverted entry (K4)

04.23 Triangular loop from top (base at bottom) with half rolls in 45 degree legs (K4)

04.24 Triangular loop from top (base at bottom) with half rolls in 45 degree legs, inverted entry (K4)

04.25 Triangular loop from top (base at bottom) with 2/4pt rolls in 45 degree legs (K4)

04.26 Triangular loop from top (base at bottom) with 2/4pt rolls in 45 legs, inverted entry (K4)

04.27 Triangular loop from top (base at bottom) with 2/4pt roll at bottom (K4)

04.28 Triangular loop from top (base at bottom) with 2/4pt roll at bottom, inverted entry (K4)

04.29 Triangular loop from top (base at bottom) with full roll (K4)

04.30 Triangular loop from top (base at bottom) with full roll, inverted entry (K4)

04.31 Knife-edge triangular loop (base at top) (K6)

04.32 Knife-edge triangular loop (base at top), inverted entry and exit (K6)

04.33 Knife-edge triangular loop (base at top), snap roll on horizontal leg (K6)

04.34 Knife-edge triangular loop (base at top), snap roll on horizontal leg, inverted entry and exit (K6)

04.35 Knife-edge triangular loop (base at top), roll on horizontal leg (K6)

04.36 Knife-edge triangular loop (base at top), roll on horizontal leg, inverted entry and exit (K6)

05.1 Square loop with half rolls (K5)

05.2 Square loop with half rolls, inverted entry (K5)

05.3 Square loop with 2/4pt rolls (K5)

05.4 Square loop with 2/4pt rolls, inverted entry (K5)

05.5 Square loop with full snap over top (K4)

05.6 Square loop with full snap over top, inverted entry (K4)

05.7 Square loop from top with half rolls (K5)

05.8 Square loop from top with half rolls, inverted entry (K5)

05.9 Square loop from top with 2/4pt rolls (K5)

05.10 Square loop from top with 2/4pt rolls, inverted entry (K5)

05.11 Square loop from top with full snap at bottom (K4)

05.12 Square loop from top with full snap at bottom, inverted entry (K4)

06.1 Square loop on corner (K3)

06.2 Square loop on corner, inverted entry (K3)

06.3 Square loop on corner with half rolls in legs 1 & 3 (K4)

06.4 Square loop on corner with half rolls in legs 1 & 3, inverted entry (K4)

06.5 Square loop on corner with full roll in leg 1, half roll in leg 3 (K4)

06.6 Square loop on corner with full roll in leg 1, half roll in leg 3, inverted entry (K4)

06.7 Square loop on corner with four half rolls (K5)

06.8 Square loop on corner with four half rolls, inverted entry (K5)

06.9 Square loop on corner from top (K3)

06.10 Square loop on corner from top , inverted entry (K3)

06.11 Square loop on corner from top with half rolls in legs 1 & 3 (K4)

06.12 Square loop on corner from top with half rolls in legs 1 & 3, inverted entry (K4)

06.13 Square loop on corner from top with full roll in leg 1, half roll in leg 3 (K4)

06.14 Square loop on corner from top with full roll in leg 1, half roll in leg 3, inverted entry (K4)

06.15 Square loop on corner from top with four half rolls (K5)

06.16 Square loop on corner from top with four half rolls, inverted entry (K5)

07.1 Six sided loop (K4)

07.2 Six sided loop, inverted entry (K4)

07.3 Six sided loop from top (K4)

07.4 Six sided loop from top , inverted entry (K4)

08.1 Cobra roll with 2/4pt rolls (K3)

08.2 Cobra roll with 2/4pt rolls, inverted entry (K3)

08.3 Cobra roll with 2/2pt rolls (K3)

08.4 Cobra roll with 2/2pt rolls, inverted entry (K3)

08.5 Cobra roll from top with half rolls (K3)

08.6 Cobra roll from top with half rolls, inverted entry (K3)

08.7 Cobra roll from top with 2/4pt rolls (K3)

08.8 Cobra roll from top with 2/4pt rolls, inverted entry (K3)

08.9 Cobra roll from top with 2/2pt rolls (K3)

08.10 Cobra roll from top with 2/2pt rolls, inverted entry (K3)

09.1 Golf ball (45 degrees up, 3/4 inside loop, 45 degrees down, pull to level), (K3)

09.2 Golf ball, inverted entry (K3)

09.3 Golf ball with half rolls (K3)

09.4 Golf ball with half rolls, inverted entry (K3)

09.5 Golf ball with 2/4pt rolls (K3)

09.6 Golf ball with 2/4pt rolls, inverted entry (K3)

10.1 Cuban eight with 2/4pt rolls (K3)

10.2 Cuban eight with 2/4pt rolls, inverted entry (K3)

10.3 Cuban eight with full rolls (K4)

10.4 Cuban eight with full rolls, inverted entry (K4)

10.5 Reverse cuban eight (from bottom) with 2/4pt rolls (K4)

10.6 Reverse cuban eight (from bottom) with 2/4pt rolls, inverted entry (K4)

10.7 Reverse cuban eight (from bottom) with full rolls (K4)

10.8 Reverse cuban eight (from bottom) with full rolls, inverted entry (K4)

10.9 Cuban eight from top with half rolls (K3)

10.10 Cuban eight from top with half rolls, inverted entry (K3)

10.11 Cuban eight from top with 2/4pt rolls (K4)

10.12 Cuban eight from top with 2/4pt rolls, inverted entry (K4)

10.13 Cuban eight from top with full rolls (K4)

10.14 Cuban eight from top with full rolls, inverted entry (K4)

10.15 Reverse cuban eight from top with half rolls (K3)

10.16 Reverse cuban eight from top with half rolls, inverted entry (K3)

10.17 Reverse cuban eight from top with 2/4pt rolls (K4)

10.18 Reverse cuban eight from top with 2/4pt rolls, inverted entry (K4)

10.19 Reverse cuban eight from top with full rolls (K4)

10.20 Reverse cuban eight from top with full rolls, inverted entry (K4)

10.21 Knife-edge Cuban eight (K6)

10.22 Knife-edge Cuban eight, inverted entry and exit (K6)

10.23 Knife-edge Cuban eight with full rolls (K6)

10.24 Knife-edge Cuban eight with full rolls, inverted entry and exit (K6)

10.25 Knife-edge reverse Cuban eight (K6)

10.26 Knife-edge reverse Cuban eight, inverted entry and exit (K6)

10.27 Knife-edge reverse Cuban eight with full rolls (K6)

10.28 Knife-edge reverse Cuban eight with full rolls, inverted entry and exit (K6)

11.1 45 degree down with full snap roll (K3)

11.2 45 degree down with full snap roll, inverted entry (K3)

11.3 45 degree down with 1 1/2 snap roll (K3)

11.4 45 degree down with 1 1/2 snap roll, inverted entry (K3)

11.5 45 degree down with two 2/4 pt rolls reversed (K4)

11.6 45 degree down with two 2/4 pt. rolls reversed, inverted entry (K4)

11.7 45 degree down with two 4/8 pt. rolls reversed (K4)

11.8 45 degree down with two 4/8 pt. rolls reversed, inverted entry (K4)

11.9 45 degree up with 1 1/2 snap roll (K4)

11.10 45 degree up with 1 1/2 snap roll, inverted entry (K4)

11.11 45 degree up with full snap roll (K3)

11.12 45 degree up with full snap roll, inverted entry (K3)

11.13 45 degree up with two 2/4 pt rolls reversed (K4)

11.14 45 degree up with two 2/4 pt rolls reversed, inverted entry (K4)

11.15 45 degree up with two 4/8 pt rolls reversed (K4)

11.16 45 degree up with two 4/8 pt rolls reversed, inverted entry (K4)

12.1 Figure Z with half roll up (K3)

12.2 Figure Z with half roll up, inverted entry (K3)

12.3 Figure Z with 2/4pt roll up (K4)

12.4 Figure Z with 2/4pt roll up, inverted entry (K4)

12.5 Figure Z with 2/2pt roll up (K4)

12.6 Figure Z with 2/2pt roll up, inverted entry (K4)

12.7 Figure Z from top with half roll down (K3)

12.8 Figure Z from top with half roll down, inverted entry (K3)

12.9 Figure Z from top with 2/4pt roll down (K4)

12.10 Figure Z from top with 2/4pt roll down, inverted entry (K4)

12.11 Figure Z from top with 2/2pt roll (K4)

12.12 Figure Z from top with 2/2pt roll, inverted entry (K4)

13.1 Hourglass (K4)

13.2 Hourglass, inverted entry (K4)

13.3 Hourglass with half rolls up and down (K4)

13.4 Hourglass with half rolls up and down, inverted entry (K5)

13.5 Hourglass with 2/4pt rolls up and down (K5)

13.6 Hourglass with 2/4pt rolls up and down, inverted entry (K5)

13.7 Hourglass (middle entry, top first) (K4)

13.8 Hourglass (middle entry, top first) inverted entry (K4)

13.9 Hourglass (middle entry, top first), half roll down (K4)

13.10 Hourglass (middle entry, top first) half roll down, inverted entry (K4)

13.11 Hourglass (middle entry, top first) 2/4pt roll down (K5)

13.12 Hourglass (middle entry, top first) 2/4pt roll down, inverted entry (K5)

13.13 Hourglass (middle entry, bottom first) (K4)

13.14 Hourglass (middle entry, bottom first), inverted entry (K4)

13.15 Hourglass (middle entry, bottom first) half roll up (K4)

13.16 Hourglass (middle entry, bottom first) half roll up, inverted entry (K4)

13.17 Hourglass (middle entry, bottom first) 2/4pt roll up (K4)

13.18 Hourglass (middle entry, bottom first) 2/4pt roll up, inverted entry (K4)

13.19 Hourglass (top entry) (K4)

13.20 Hourglass (top entry), inverted entry (K4)

13.21 Hourglass (top entry) with half rolls down and up (K5)

13.22 Hourglass (top entry) with half rolls down and up, inverted entry (K5)

13.23 Hourglass (top entry) with 2/4pt rolls down and up (K5)

13.24 Hourglass (top entry) with 2/4pt rolls down and up, inverted entry (K5)

14.1 Vertical eight (from bottom) (K3)

14.2 Vertical eight (from bottom) inverted entry (K3)

14.3 Vertical eight (from bottom) with half rolls (K4)

14.4 Vertical eight (from bottom) with half rolls, inverted entry (K4)

14.5 Vertical eight (from bottom) with half roll after first half loop (K4)

14.6 Vertical eight (from bottom) with half roll after first half loop, inverted entry (K4)

14.7 Vertical eight (from middle) (K3)

14.8 Vertical eight (from middle) inverted entry (K3)

14.9 Vertical eight (from middle) with half roll (K3)

14.10 Vertical eight (from middle) with half roll, inverted entry (K3)

14.11 Vertical eight (from top) (K3)

14.12 Vertical eight (from top) inverted entry (K3)

14.13 Vertical eight (from top) with half rolls (K4)

14.14 Vertical eight (from top) with half rolls, inverted entry (K4)

14.15 Vertical eight (from top) with half roll after first half loop (K4)

14.16 Vertical eight (from top) with half roll after first half loop, inverted entry (K4)

14.17 Vertical knife-edge eight (K6)

14.18 Vertical Knife-edge eight, inverted entry and exit (K6)

14.19 Vertical Knife-edge eight with two half roll (K6)

14.20 Vertical Knife-edge eight with two half roll, inverted entry and exit (K6)

14.21 Vertical Knife-edge eight, middle entry and exit, top first (K6)

14.22 Vertical Knife-edge eight, middle entry and exit, top first (K6)

15.1 Square horizontal eight (K5)

15.2 Square horizontal eight, inverted entry (K5)

15.3 Square horizontal eight (from top) (K5)

15.4 Square horizontal eight (from top) inverted entry (K5)

15.5 Square vertical eight (from bottom) (K5)

15.6 Square vertical eight (from bottom) inverted entry (K5)

15.7 Square vertical eight (from bottom) with half rolls (K5)

15.8 Square vertical eight (from bottom) with half rolls, inverted entry (K5)

15.9 Square vertical eight (from middle) (K5)

15.10 Square vertical eight (from middle) inverted entry (K5)

15.11 Square vertical eight (from middle) with half roll (K5)

15.12 Square vertical eight (from middle) with half roll, inverted entry (K5)

15.13 Square vertical eight (from top) (K5)

15.14 Square vertical eight (from top) inverted entry (K5)

15.15 Square vertical eight (from top) with half rolls (K5)

15.16 Square vertical eight (from top) with half rolls, inverted entry (K5)

16.1 Figure M with 3/4 rolls

Centre half-loop is always flown negative (inverted) (K5)

16.2 Figure M with 3/4 rolls, inverted entry (K5)

16.3 Figure M with 3/4 pt rolls (K5)

16.4 Figure M with 3/4 pt rolls, inverted entry (K5)

16.5 Figure M with 3/4pt rolls up, 1/4 rolls down (K5)

16.6 Figure M with 3/4pt rolls up, 1/4 rolls down, inverted entry (K5)

17.1 Top hat with 2/4pt rolls (K4)

17.2 Top hat with 2/4pt rolls, inverted entry (K4)

17.3 Top hat with 2/2pt rolls (K4)

17.4 Top hat with 2/2pt rolls, inverted entry (K4)

17.5 Top hat from top with 2/4pt rolls (K4)

17.6 Top hat from top with 2/4pt rolls, inverted entry (K4)

17.7 Top hat from top with 2/2pt rolls (K4)

17.8 Top hat from top with 2/2pt rolls, inverted entry (K4)

18.1 Humpty bump, half roll up, 2/4pt roll down (K4)

18.2 Humpty bump, 1/2 roll up, 2/4pt roll down, inverted entry (K4)

18.3 Humpty bump, 2/4pt roll up, full snap down (K5)

18.4 Humpty bump, 2/4pt roll up, full snap down, inverted entry (K5)

18.5 Humpty bump from top, half roll down, 2/4pt roll up (K4)

18.6 Humpty bump from top, half roll down, 2/4pt roll up, inverted entry (K4)

18.7 Humpty bump from top, 2/4pt roll down, full roll up (K4)

18.8 Humpty bump from top, 2/4pt roll down, full roll up, inverted entry (K4)

19.1 2 1/2 turn spin, inverted exit (K3)

19.2 2 1/2 turn spin, inverted entry, upright exit (K3)

19.3 2 turn opposite spin (K4)

19.4 Two turn opposite spin, inverted entry (K4)

19.5 Three turn spin (K3)

19.6 Three turn spin, inverted entry (K3)

19.7 2 1/2 Turn spin, half roll exit (K3)

19.8 2 1/2 turn spin, half roll exit, inverted entry (K3)

19.9 2 1/4 turn spin, 1/4 loop with 1/4 roll integrated. Entry upright. Exit upright (K4)

19.10 2 1/4 turn spin, 1/4 loop with 1/4 roll integrated. Entry upright. Exit inverted (K4)

19.11 2 1/4 turn spin, 1/4 loop with 1/4 roll integrated. Entry inverted. Exit upright. (K4)

19.12 2 1/4 turn spin, 1/4 loop with 1/4 roll integrated. Entry inverted. Exit inverted (K4)

20.1 Stall turn 3/4 roll up, 3/4pt roll down (K3)

20.2 Stall turn, 3/4 roll up, 3/4pt roll down, inverted entry (K3)

20.3 Stall turn 3/4 roll up, 3/4 pt roll down, inverted exit (K3)

20.4 Stall turn, 3/4 roll up, 1 1/4 snap roll down (K5)

20.5 Stall turn, 3/4 roll up, 1 1/4 snap roll down, inverted entry (K5)

20.6 Stall turn, 3/4 roll up, 1 1/4 snap roll down, inverted exit (K5)

20.7 Stall turn, 3/4pt roll up, 1 1/4 snap roll down (K5)

20.8 Stall turn, 3/4pt roll up, 1 1/4 snap roll down, inverted entry (K5)

20.9 Stall turn, 3/4pt roll up, 1 1/4 snap roll down, inverted exit (K5)

21.1 Double Immelmann with half rolls (K3)

21.2 Double Immelmann with half rolls, inverted entry (K3)

21.3 Double Immelmann with half roll first, full roll second (K4)

21.4 Double Immelmann with half roll first, full roll second, inverted entry (K4)

21.5 Double Immelmann with full rolls (K3)

21.6 Double Immelmann with full rolls, inverted entry (K3)

21.7 Double Immelmann from top, half rolls (K3)

21.8 Double Immelmann from top, half rolls, inverted entry (K3)

21.9 Double Immelmann from top, half roll first, full roll second (K4)

21.10 Double Immelmann from top, half roll first, full roll second, inverted entry (K4)

21.11 Double Immelmann from top with full rolls (K4)

21.12 Double Immelmann from top with full rolls, inverted entry (K4)

22.1 Rolling circle with one roll inside (K5)

22.2 Rolling circle with one roll inside, inverted entry (K5)

22.3 Rolling circle with one roll outside (K5)

22.4 Rolling circle with one roll outside, inverted entry (K5)

22.5 Rolling circle with 2 rolls inside (K5)

22.6 Rolling circle with 2 rolls inside, inverted entry (K5)

22.7 Rolling circle with 2 rolls outside (K5)

22.8 Rolling circle with 2 rolls outside, inverted entry (K5)

22.9 Rolling circle with 4 rolls inside (K5)

22.10 Rolling circle with 4 rolls inside, inverted entry (K5)

22.11 Rolling circle with 4 rolls outside (K5)

22.12 Rolling circle with 4 rolls outside, inverted entry (K5)

23.1 1 1/2 rolls reversed (K4)

23.2 1 1/2 rolls reversed, inverted entry (K4)

23.3 Two rolls reversed (K4)

23.4 Two rolls reversed, inverted entry (K4)

23.5 Four point roll (K4)

23.6 Four point roll, inverted entry (K4)

23.7 Eight point roll (K4)

23.8 Eight point roll, inverted entry (K4)

23.9 Two 3/4 pt. rolls reversed (K4)

23.10 Two 3/4 pt. rolls reversed, inverted entry (K4)

23.11 Two 2/2 pt. rolls reversed (K4)

23.12 Two 2/2 pt. rolls reversed, inverted entry (K4)

23.13 Two 2/4 pt. rolls reversed (K4)

23.14 Two 2/4 pt. rolls reversed, inverted entry (K4)

23.15 Slow roll (K3)

23.16 Slow roll, inverted entry (K3)

23.17 Knife edge flight (K4)

23.18 Knife edge flight, inverted entry (K4)

23.19 Reverse knife edge flight (K5)

23.20 Reverse knife edge flight, inverted entry (K5)

23.21 One horizontal snap roll (K3)

23.22 One horizontal snap roll, inverted entry (K4)

23.23 Two snap rolls reversed (K5)

23.24 Two snap rolls reversed, inverted entry (K5)

23.25 2/2pt roll, full snap roll opposite (K5)

23.26 2/2pt roll, full snap roll opposite, inverted entry (K5)

23.27 2/4pt roll, 1 1/2 snap roll opposite (K5)

23.28 2/4pt roll, 1 1/2 snap roll opposite, inverted entry (K5)

24.1 Double key: pull into vertical upline, 3/4 pt. roll up, 5/8 knife-edge loop towards the back, 3/4 roll down, pull into 45 degree upline, 3/4 roll up, 5/8 knife-edge loop towards the back, 3/4 pt. roll down, pull to exit upright (K6)

24.2 Double key: from inverted push into vertical upline, 3/4 pt. roll up, 5/8 knife-edge loop towards the back, 3/4 roll down, pull into 45 degree upline, 3/4 roll up, 5/8 knife-edge loop towards the back, 3/4 pt. roll down, push to exit inverted (K6)

24.3 Double key: pull into vertical upline, 3/4 pt. roll up, 5/8 knife-edge loop towards the back, 3/4 roll down, push into 45 degree upline, 3/4 roll up, 5/8 knife-edge loop towards the back, 3/4 pt. roll down, pull to exit upright (K6)

24.4 Double key: from inverted push into vertical upline, 3/4 pt. roll up, 5/8 knife-edge loop towards the back, 3/4 roll down, push into 45 degree upline, 3/4 roll up, 5/8 knife-edge loop towards the back, 3/4 pt. roll down, push to exit inverted (K6)

25.1 Horizontal eight with one roll integrated in each loop (K6)

25.2 Horizontal eight with one roll integrated in each loop, inverted entry and exit (K6)

25.3 Horizontal eight with two rolls integrated in each loop (K6)

25.4 Horizontal eight with two rolls integrated in each loop, inverted entry and exit (K6)

25.5 Horizontal eight with four rolls integrated in each loop (K6)

25.6 Horizontal eight with four rolls integrated in each loop, inverted entry and exit (K 6)

26.1 Figure N. Vertical upline from upright, 1/4 roll, stall turn, 1/8 knife-edge loop, 45° knife-edge downline, 3/8 knife-edge loop, 1/2 roll, stall turn, 1/4 roll, exit upright (K6)

26.2 Figure N. Vertical upline from upright, 1/4 roll, stall turn, 1/8 knife-edge loop, 45° knife-edge downline, 3/8 knife-edge loop, 1/2 roll, stall turn, 1/4 roll, exit inverted (K6)

26.3 Figure N. Vertical upline from inverted, 1/4 roll, stall turn, 1/8 knife-edge loop, 45° knife-edge downline, 3/8 knife-edge loop, 1/2 roll, stall turn, 1/4 roll, exit upright (K6)

26.4 Figure N. Vertical upline from inverted, 1/4 roll, stall turn, 1/8 knife-edge loop, 45° knife-edge downline, 3/8 knife-edge loop, 1/2 roll, stall turn, 1/4 roll, exit inverted (K6)

26.5 Figure N. Vertical line from upright, roll, 3/8 pushed loop, 45° downline, snap roll, 3/8 pulled loop, vertical upline, 1 1/4 snap-roll, stall turn, 1/4 roll, exit upright (K6)

26.6 Figure N. Vertical line from upright, roll, 3/8 pushed loop, 45° downline, snap roll, 3/8 pulled loop, vertical upline, 1 1/4 snap-roll, stall turn, 1/4 roll, exit inverted (K6)

26.7 Figure N. Vertical line from inverted, roll, 3/8 pulled loop, 45° downline, snap roll, 3/8 pushed loop, vertical upline, 1 1/4 snap-roll, stall turn, 1/4 roll, exit upright (K6)

26.8 Figure N. Vertical line from inverted, roll, 3/8 pulled loop, 45° downline, snap roll, 3/8 pushed loop, vertical upline, 1 1/4 snap-roll, stall turn, 1/4 roll, exit inverted (K6)

27.1 Infinite loop. From upright, past centre, 1/2 loop with integrated 1/2 roll, 1/8 pushed loop, two opposite snap-rolls, 1/8 loop, ½ pulled loop with integrated 1/2 roll, exit upright. (K6)

27.2 Infinite loop. From inverted, past centre, 1/2 loop with integrated 1/2 roll, 1/8 pulled loop, two opposite snap-rolls, ⅛ pushed loop, 1/2 loop with integrated 1/2 roll, exit inverted. (K6)

27.3 Infinite loop. From upright, four consecutive 1/4 rolls, 1/2 loop with integrated 1/2 roll, 1/8 pushed loop, two opposite snap-rolls, ⅛ pulled loop, 1/2 loop with integrated 1/2 roll, two opposite 1/2 rolls, exit upright. (K6)

27.4 Infinite loop. From inverted, four consecutive 1/4 rolls, 1/2 loop with integrated 1/2 roll, ⅛ pulled loop, two opposite snap-rolls, ⅛ pushed loop, 1/2 loop with integrated 1/2 roll, two opposite 1/2 rolls, exit inverted. (K6)

28.1 Figure H. From upright, 1/4 loop, 3/4 snap-roll, stall turn, 1/4 knife-edge loop, line with roll, 1/4 knife-edge loop, stall turn, 3/4 snap-roll, 1/4 roll. Exit upright (K6)

28.2 Figure H. From upright, 1/4 loop, 3/4 snap-roll, stall turn, 1/4 knife-edge loop, line with roll, 1/4 knife-edge loop, stall turn, 3/4 snap-roll, 1/4 roll. Exit inverted (K6)

28.3 Figure H. From inverted, 1/4 loop, 3/4 snap-roll, stall turn, 1/4 knife-edge loop, line with roll, 1/4 knife-edge loop, stall turn, 3/4 snap-roll, 1/4 roll. Exit upright (K6)

28.4 Figure H. From inverted, 1/4 loop, 3/4 snap-roll, stall turn, 1/4 knife-edge loop, line with roll, 1/4 knife-edge loop, stall turn, 3/4 snap-roll, 1/4 roll. Exit inverted (K6)

29.1 Half clover leaf. From bottom upright, 3/4 roll, 3/4 knife-edge loop, snap-roll, ¾ knife-edge loop, 3/4 roll. Exit upright. (K5)

29.2 Half clover leaf. From bottom upright, 3/4 roll, 3/4 knife-edge loop, snap-roll, 3/4 knife-edge loop, 3/4 roll. Exit inverted. (K5)

29.3 Half clover leaf. From bottom inverted, 3/4 roll, 3/4 knife-edge loop, snap-roll, 3/4 knife-edge loop, 3/4 roll. Exit upright. (K5)

29.4 Half clover leaf. From bottom inverted, 3/4 roll, 3/4 knife-edge loop, snap-roll, 3/4 knife-edge loop, 3/4 roll. Exit inverted (K5)

29.5 Half clover leaf. From top upright, 3/4 roll, 3/4 knife-edge loop, snap-roll, 3/4 knife-edge loop, 3/4 roll. Exit upright. (K5)

29.6 Half clover leaf. From top upright, 3/4 roll, 3/4 knife-edge loop, snap-roll, 3/4 knife-edge loop, 3/4 roll. Exit inverted. (K5)

29.7 Half clover leaf. From top inverted, 3/4 roll, 3/4 knife-edge loop, snap-roll, 3/4 knife-edge loop, 3/4 roll. Exit upright. (K5)

29.8 Half clover leaf. From top inverted, 3/4 roll, 3/4 knife-edge loop, snap-roll, 3/4 knife-edge loop, 3/4 roll. Exit inverted. (K5)

30.1 Diamond in a loop. From bottom upright, pulled loop with two opposite integrated half-rolls, square loop on corner with half-roll in each leg. Exit upright. N.B. Radii for loop and square loop can be different. (K5)

30.2 Diamond in a loop. From bottom inverted, pushed loop with two opposite integrated half-rolls, square loop on corner with half-roll in each leg. Exit inverted.

N.B. Radii for loop and square loop can be different. (K5) (K5)

30.3 Diamond in a loop From top upright, pushed loop with two opposite integrated half-rolls, square loop on corner with half-roll in each leg. Exit upright. N.B. Radii for loop and square loop can be different. (K5)

30.4 Diamond in a loop. From top inverted, puled loop with two opposite integrated half-rolls, square loop on corner with half-roll in each leg. Exit inverted. N.B. Radii for loop and square loop can be different. (K5)

5G.8.2 Turnaround manoeuvres

A.5 Half square loop with 2/4pt roll up (K2)

A.6 Half square loop with 2/4pt roll up, inverted entry (K2)

A.7 Half square loop with 2/2pt roll up (K2)

A.8 Half square loop with 2/2pt roll up, inverted entry (K2)

A.9 Half square loop with full roll up (K2)

A.10 Half square loop with full roll up, inverted entry (K2)

A.15 Half square loop from top, 2/4pt roll down (K2)

A.16 Half square loop from top, 2/4pt roll down , inverted entry (K2)

A.17 Half square loop from top, 2/2pt roll down (K2)

A.18 Half square loop from top, 2/2pt roll down, inverted entry (K2)

A.19 Half square loop from top, full roll down (K2)

A.20 Half square loop from top, full roll down, inverted entry (K2)

A.21 Half square loop from top, full snap down (K3)

A.22 Half square loop from top, full snap down, inverted entry (K3)

A.23 Half square loop from upright, 1/4 roll integrated, snap-roll, 1/4 roll integrated, exit upright (K4)

A.24 Half square loop from upright, 1/4 roll integrated, snap-roll, 1/4 roll integrated, exit inverted (K4)

A.25 Half square loop from inverted, 1/4 roll integrated, snap-roll, 1/4 roll integrated, exit upright (K4)

A.26 Half square loop from inverted, 1/4 roll integrated, snap-roll, 1/4 roll integrated, exit inverted (K4)

A.27 Half square loop from top upright, 1/4 roll integrated, snap-roll, 1/4 roll integrated, exit upright (K4)

A.28 Half square loop from top inverted, 1/4 roll integrated, snap-roll, 1/4 roll integrated, exit upright (K4)

A.29 Half square loop from top upright, 1/4 roll integrated, snap-roll, 1/4 roll integrated, exit inverted (K4)

A.30 Half square loop from top inverted, 1/4 roll integrated, snap-roll, 1/4 roll integrated, exit inverted (K4)

C.3 Split S , full roll, from top (K2)

C.4 Split S , full roll, from top, inverted entry (K2)

D.1 Immelmann turn (K2)

D.2 Immelmann turn, inverted entry (K2)

D.3 Immelmann turn, full roll (K2)

D.4 Immelmann turn, full roll, inverted entry (K2)

D.5 Immelmann Turn from upright with 1/4 roll, knife-edge half loop up, 3/4 roll, exit upright (K4)

D.6 Immelmann Turn from upright with 1/4 roll, knife-edge half loop up, 3/4 roll, exit inverted (K4)

D.7 Immelmann Turn from upright with 1/4 roll, knife-edge half loop down, 3/4 roll, exit upright (K4)

D.8 Immelmann Turn from upright with 1/4 roll, knife-edge half loop down, 3/4 roll, exit inverted (K4)

D.9 Immelmann Turn from inverted with 1/4 roll, knife-edge half loop up, 3/4 roll, exit upright (K4)

D.10 Immelmann Turn from inverted with 1/4 roll, knife-edge half loop up, 3/4 roll, exit inverted (K4)

D.11 Immelmann Turn from inverted with 1/4 roll, knife-edge half loop down, 3/4 roll, exit upright (K4)

D.12 Immelmann Turn from inverted with 1/4 roll, knife-edge half loop down, 3/4 roll, exit inverted (K4)

E.5 Figure 9 from bottom, 2/4pt roll up (K2)

E.6 Figure 9 from bottom, 2/4pt roll up, inverted entry (K2)

E.7 Figure 9 from bottom, 2/2pt roll up (K2)

E.8 Figure 9 from bottom, 2/2pt roll up, inverted entry (K2)

E.9 Figure 9 from bottom, full roll up (K2)

E.10 Figure 9 from bottom, full roll up, inverted entry (K2)

E.15 Figure 6 from middle (bottom first), 2/4pt roll up (K2)

E.16 Figure 6 from middle (bottom first), 2/4pt roll up, inverted entry (K2)

E.17 Figure 6 from middle (bottom first), 2/2pt roll up (K2)

E.18 Figure 6 from middle (bottom first), 2/2pt roll up, inverted entry (K2)

E.19 Figure 6 from middle (bottom first), full roll up (K2)

E.20 Figure 6 from middle (bottom first), full roll up, inverted entry (K2)

E.25 Figure 9 from middle (top first), 2/4pt roll down (K2)

E.26 Figure 9 from middle (top first), 2/4pt roll down, inverted entry (K2)

E.27 Figure 9 from middle (top first), 2/2pt roll down (K2)

E.28 Figure 9 from middle (top first), 2/2pt roll down, inverted entry (K2)

E.29 Figure 9 from middle (top first), full roll down (K2)

E.30 Figure 9 from middle (top first), full roll down, inverted entry (K2)

E.31 Figure 9 from middle (top first), full snap down (K3)

E.32 Figure 9 from middle (top first), full snap down, inverted entry (K3)

E.37 Figure 6 from top, 2/4pt roll down (K2)

E.38 Figure 6 from top, 2/4pt roll down, inverted entry (K2)

E.39 Figure 6 from top, 2/2pt roll down (K2)

E.40 Figure 6 from top, 2/2pt roll down, inverted entry (K2)

E.41 Figure 6 from top, full roll down (K2)

E.42 Figure 6 from top , full roll down, inverted entry (K2)

E.43 Figure 6 from top, full snap down (K3)

E.44 Figure 6 from top, full snap down, inverted entry (K3)

E.45 Figure 9 from bottom upright with snap roll up (K3)

E.46 Figure 9 from bottom inverted with snap roll up (K3)

E.47 Figure 9 from bottom upright with 1 1/2 snap rolls up (K3)

E.48 Figure 9 from bottom inverted with 1 1/2 snap rolls up (K3)

E.49 Figure 9 from bottom upright with integrated roll in top 180 degree of loop, exit inverted (K3)

E.50 Figure 9 from bottom inverted with integrated roll in top 180 degree of loop, exit upright (K3)

E.51 Figure 6 from top upright with integrated 1/2 roll on bottom 180 degree of loop, exit upright (K3)

E.52 Figure 6 from top inverted with integrated 1/2 roll on bottom 180 degree of loop, exit inverted (K3)

E.53 Figure 9 from bottom upright with 1/4 roll up, 3/4 knife edge loop, 1/4 roll, exit upright (K4)

E.54 Figure 9 from bottom upright with 1/4 roll up, 3/4 knife edge loop, 1/4 roll, exit inverted (K4)

E.55 Figure 9 from bottom inverted with 1/4 roll up, 3/4 knife edge loop, 1/4 roll, exit upright (K4)

E.56 Figure 9 from bottom inverted with 1/4 roll up, 3/4 knife edge loop, 1/4 roll, exit inverted (K4)

E.57 Figure 9 from bottom upright with 3 consecutive 1/4 rolls up, 3/4 knife edge loop, 3 consecutive 1/4 rolls, exit upright (K4)

E.58 Figure 9 from bottom upright with 3 consecutive 1/4 rolls up, 3/4 knife edge loop, 3 consecutive 1/4 rolls, exit inverted (K4)

E.59 Figure 9 from bottom inverted with 3 consecutive 1/4 rolls up, 3/4 knife edge loop, 3 consecutive 1/4 rolls, exit upright (K4)

E.60 Figure 9 from bottom inverted with 3 consecutive 1/4 rolls up, 3/4 knife edge loop, 3 consecutive 1/4 rolls, exit inverted (K4)

E.61 Figure 9 from middle upright with 3 consecutive 1/4 rolls , 3/4 knife edge loop, 3 consecutive 1/4 rolls, exit upright (K4)

E.62 Figure 9 from middle upright with 3 consecutive 1/4 rolls , 3/4 knife edge loop, 3 consecutive 1/4 rolls, exit inverted (K4)

E.63 Figure 9 from middle inverted with 3 consecutive 1/4 rolls , 3/4 knife edge loop, 3 consecutive 1/4 rolls, exit upright (K4)

E.64 Figure 9 from middle inverted with 3 consecutive 1/4 rolls , 3/4 knife edge loop, 3 consecutive 1/4 rolls, exit inverted (K4)

E.65 Figure 6 from middle upright with 3 consecutive 1/4 rolls , 3/4 knife edge loop, 3 consecutive 1/4 rolls, exit upright (K4)

E.66 Figure 6 from middle upright with 3 consecutive 1/4 rolls, 3/4 knife edge loop, 3 consecutive 1/4 rolls, exit inverted (K4)

E.67 Figure 6 from middle inverted with 3 consecutive 1/4 rolls, 3/4 knife edge loop, 3 consecutive 1/4 rolls, exit upright (K4)

E.68 Figure 6 from middle inverted with 3 consecutive 1/4 rolls, 3/4 knife edge loop, 3 consecutive 1/4 rolls, exit inverted (K4)

E.69 Figure 6 from top upright with 3/4 snap roll down, 3/4 knife edge loop, 3 consecutive 1/4 rolls, exit upright (K4)

E.70 Figure 6 from top upright with 3/4 snap roll down, 3/4 knife edge loop, 3 consecutive 1/4 rolls, exit inverted (K4)

E.71 Figure 6 from top inverted with 3/4 snap roll down, 3/4 knife edge loop, 3 consecutive 1/4 rolls, exit upright (K4)

E.72 Figure 6 from top inverted with 3/4 snap roll down, 3/4 knife edge loop, 3 consecutive 1/4 rolls, exit inverted (K4)

F.3 Half cuban eight, 2/4pt roll (K2)

F.4 Half cuban eight, 2/4pt roll, inverted entry (K2)

F.5 Half cuban eight, 2/2pt roll (K2)

F.6 Half cuban eight, 2/2pt roll, inverted entry (K2)

F.7 Half cuban eight with full roll (K2)

F.8 Half cuban eight with full roll, inverted entry (K2)

F.9 Half cuban eight with full snap roll (K3)

F.10 Half cuban eight with full snap roll, inverted entry (K3)

F.11 Half cuban eight with 1 1/2 snap roll (K3)

F.12 Half cuban eight with 1 1/2 snap roll, inverted entry (K3)

F.15 Half cuban eight from top, 2/4pt roll up (K2)

F.16 Half cuban eight from top, 2/4pt roll up, inverted entry (K2)

F.17 Half cuban eight from top, 2/2pt roll up (K2)

F.18 Half cuban eight from top, 2/2pt roll up, inverted entry (K2)

F.19 Half cuban eight from top, full roll up (K2)

F.22 Half reverse cuban eight, inverted entry (K2)

F.23 Half reverse cuban eight, 2/4pt roll (K2)

F.24 Half reverse cuban eight, 2/4pt roll, inverted entry (K2)

F.25 Half reverse cuban eight, 2/2pt roll (K2)

F.26 Half reverse cuban eight, 2/2pt roll, inverted entry (K2)

F.27 Half reverse cuban eight with full roll (K2)

F.28 Half reverse cuban eight with full roll, inverted entry (K2)

F.29 Half reverse cuban eight with full snap roll (K3)

F.30 Half reverse cuban eight with full snap roll, inverted entry (K3)

F.31 Half reverse cuban eight with 1 1/2 snap roll (K3)

F.32 Half reverse cuban eight with 1 1/2 snap roll, inverted entry (K3)

F.35 Half reverse cuban eight from top, 2/4pt roll down (K2)

F.36 Half reverse cuban eight from top, 2/4pt roll down, inverted entry (K2)

F.37 Half reverse cuban eight from top, 2/2pt roll down (K2)

F.38 Half reverse cuban eight from top, 2/2pt roll down, inverted entry (K2)

F.39 Half reverse cuban eight from top, full roll down (K2)

F.40 Half reverse cuban eight from top, full roll down, inverted entry (K2)

F.41 Half Cuban Eight from upright up with 1/2 roll integrated in first 180 degree of loop, exit upright (K3)

F.42 Half Cuban Eight from inverted up with 1/2 roll integrated in first 180 degree of loop, exit inverted (K3)

F.43 Half Cuban Eight from upright up with roll integrated in first 180 degree of loop, exit inverted (K4)

F.44 Half Cuban Eight from inverted up with roll integrated in first 180 degree of loop, exit upright (K4)

F.45 Half Cuban Eight from upright down with 1/2 roll integrated in first 180 degree of loop, exit upright (K3)

F.46 Half Cuban Eight from inverted down with 1/2 roll integrated in first 180 degree of loop, exit inverted (K3)

F.47 Half Cuban Eight from upright down with roll integrated in first 180 degree of loop, exit inverted (K4)

F.48 Half Cuban Eight from inverted down with roll integrated in first 180 degree of loop, exit upright (K4)

F.49 Half cuban eight from upright with 3 consecutive 1/4 rolls, 5/8 knife edge loop, 3/4 roll, exit upright (K4)

F.50 Half cuban eight from upright with 3 consecutive 1/4 rolls, 5/8 knife edge loop, 3/4 roll, exit inverted (K4)

F.51 Half cuban eight from inverted with 3 consecutive 1/4 rolls, 5/8 knife edge loop, 3/4 roll, exit upright (K4)

F.52 Half cuban eight from inverted with 3 consecutive 1/4 rolls, 5/8 knife edge loop, 3/4 roll, exit inverted (K4)

F.53 Half reverse cuban eight from upright with 3 consecutive 1/4 rolls, 5/8 knife edge loop, 3/4 roll, exit upright (K4)

F.54 Half reverse cuban eight from upright with 3 consecutive 1/4 rolls, 5/8 knife edge loop, 3/4 roll, exit inverted (K4)

F.55 Half reverse cuban eight from inverted with 3 consecutive 1/4 rolls, 5/8 knife edge loop, 3/4 roll, exit upright (K4)

F.56 Half reverse cuban eight from inverted with 3 consecutive 1/4 rolls, 5/8 knife edge loop, 3/4 roll, exit inverted (K4)

F.57 Half cuban eight from top upright with 3 consecutive 1/4 rolls, 5/8 knife edge loop, 3/4 roll, exit upright (K4)

F.58 Half cuban eight from top upright with 3 consecutive 1/4 rolls, 5/8 knife edge loop, 3/4 roll, exit inverted (K4)

F.59 Half cuban eight from top inverted with 3 consecutive 1/4 rolls, 5/8 knife edge loop, 3/4 roll, exit upright (K4)

F.60 Half cuban eight from top inverted with 3 consecutive 1/4 rolls, 5/8 knife edge loop, 3/4 roll, exit inverted (K4)

F.61 Half reverse cuban eight from top upright with 3 consecutive 1/4 rolls, 5/8 knife edge loop, 3/4 roll, exit upright (K4)

F.62 Half reverse cuban eight from top upright with 3 consecutive 1/4 rolls, 5/8 knife edge loop, 3/4 roll, exit inverted (K4)

F.63 Half reverse cuban eight from top inverted with 3 consecutive 1/4 rolls, 5/8 knife edge loop, 3/4 roll, exit upright (K4)

F.64 Half reverse cuban eight from top inverted with 3 consecutive 1/4 rolls, 5/8 knife edge loop, 3/4 roll, exit inverted (K4)

G.1 Two turn spin (K2)

G.2 Two turn spin, inverted entry (K2)

G.3 2 1/2 turn spin (K2)

G.4 2 1/2 turn spin, inverted entry (K2)

G.5 2 1/4 turn spin, 1/4 loop with 1/4 roll integrated. Entry upright. Exit upright (K4)

G.6 2 1/4 turn spin, 1/4 loop with 1/4 roll integrated. Entry upright. Exit inverted (K4)

G.7 2 1/4 turn spin, 1/4 loop with 1/4 roll integrated. Entry inverted. Exit upright (K4)

G.8 2 1/4 turn spin, 1/4 loop with 1/4 roll integrated. Entry inverted. Exit inverted (K4)

H.3 Stall turn, half roll up, 2/4pt roll down (K2)

H.4 Stall turn, half roll up, 2/4pt roll down, inverted entry (K2)

H.5 Stall turn, full roll up, half roll down (K2)

H.6 Stall turn, full roll up, half roll down, inverted entry (K2)

H.7 Stall turn, 2/4pt roll up, half roll down (K2)

H.8 Stall turn, 2/4pt roll up, half roll down, inverted entry (K2)

H.9 Stall turn, 2/2pt roll up, 2/4pt roll down (K2)

H.10 Stall turn, 2/2pt roll up, 2/4pt roll down, inverted entry (K2)

H.11 Stall turn, half roll up, full snap down (K4)

H.12 Stall turn, half roll up, full snap down, inverted entry (K4)

H.13 Stall turn, 3/4pt roll up, 1/4 roll down (K3)

H.14 Stall turn, 3/4pt roll up 1/4 roll down, inverted entry (K3)

H.15 Stall turn, 3/4 roll up, 1 1/4 snap down (K4)

H.16 Stall turn 3/4 roll up, 1 1/4 snap down, inverted entry (K4)

J.1 Top hat, 3/4 roll up, 1/4 roll down (K2)

J.2 Top hat, 3/4 roll up, 1/4 roll down, inverted entry (K2)

J.3 Top hat, 3/4pt roll up, 3/4 roll down (K2)

J.4 Top hat, 3/4pt roll up, 3/4 roll down, inverted entry (K2)

J.5 Top hat, 3/4pt roll up, 3/4 pt roll down, inverted exit (K2)

J.6 Top hat, 3/4pt roll up, 3/4pt roll down, inverted entry and exit (K2)

J.7 Top hat, 1/4 roll up, 1/4 roll down (K2)

J.8 Top hat, 1/4 roll up, 1/4 roll down, inverted entry (K2)

J.9 Top hat, 1/4 roll up, 1/4 roll down, inverted exit (K2)

J.10 Top hat, 1/4 roll up, 1/4 roll down, inverted entry and exit (K2)

J.11 Top hat from top, 3/4 roll down, 3/4pt roll up (K3)

J.12 Top hat from top, 3/4 roll down, 3/4pt roll up, inverted entry (K3)

J.13 Top hat from top, 3/4 roll down, 1/4 roll up (K2)

J.14 Top hat from top, 3/4 roll down, 1/4 roll up, inverted entry (K2)

J.15 Top hat from top, 1/4 roll down, 3/4pt roll up (K2)

J.16 Top hat from top, 1/4 roll down, 3/4pt roll up, inverted entry (K2)

J.17 Top Hat, from upright, three consecutive 1/4 rolls up, 1 3/4 snap roll down, exit upright (K4)

J.18 Top Hat, from upright, three consecutive 1/4 rolls up, 1 3/4 snap roll down, exit inverted (K4)

J.19 Top Hat, from inverted, three consecutive 1/4 rolls up, 1 3/4 snap roll down, exit upright (K4)

J.20 Top Hat, from inverted, three consecutive 1/4 rolls up, 1 3/4 snap roll down, exit inverted (K4)

J.22 Top Hat, from top upright, 3/4 roll down, 1 3/4 snap roll up, exit upright (K4)

J.23 Top Hat, from top upright, 3/4 roll down, 1 3/4 snap roll up, exit inverted (K4)

J.24 Top Hat, from top inverted, 3/4 roll down, 1 3/4 snap roll up, exit upright (K4)

J.25 Top Hat, from top inverted, 3/4 roll down, 1 3/4 snap roll up, exit inverted (K4)

J.26 Top Hat, from upright, 3/4 roll up, 1 1/4 snap roll down, exit upright (K4)

J.27 Top Hat, from upright, 3/4 roll up, 1 1/4 snap roll down, exit inverted (K4)

J.28 Top Hat, from inverted, 3/4 roll up, 1 1/4 snap roll down, exit upright (K4)

J.29 Top Hat, from inverted, 3/4 roll up, 1 1/4 snap roll down, exit inverted (K4)

J.30 Top Hat, from top upright, 3/4 roll down, 1 1/4 snap roll up, exit upright (K4)

J.31 Top Hat, from top upright, 3/4 roll down, 1 1/4 snap roll up, exit inverted (K4)

J.32 Top Hat, from top inverted, 3/4 roll down, 1 1/4 snap roll up, exit upright (K4)

J.33 Top Hat, from top inverted, 3/4 roll down, 1 1/4 snap roll up, exit inverted (K4)

J.34 Top Hat, from upright, 1/2 roll up, snap roll down, exit upright (K3)

J.35 Top Hat, from inverted, 1/2 roll up, snap roll down, exit inverted (K3)

J.36 Top Hat, from top upright, 1/2 roll down, snap roll up, exit upright (K3)

J.37 Top Hat, from top inverted, 1/2 roll down, snap roll up, exit inverted (K3)

J.38 Top Hat from top upright with 2 1/4 turn Spin entry, 3/4 Roll up, exit upright (K4)

J.39 Top Hat from top upright with 2 1/4 turn Spin entry, 3/4 Roll up, exit inverted (K4)

J.40 Top Hat from top inverted with 2 1/4 turn Spin entry, 3/4 Roll up, exit upright (K4)

J.41 Top Hat from top inverted with 2 1/4 turn Spin entry, 3/4 Roll up, exit inverted (K4)

J.42 Top Hat from top upright with 2 turn Spin entry, Full Roll up, exit inverted (K3)

J.43 Top Hat from top inverted with 2 turn Spin entry, Full Roll up, exit upright (K3)

J.44 Top Hat from top upright with 2 turn Spin entry, four consecutive 1/4 rolls up, exit inverted (K3)

J.45 Top Hat from top inverted with 2 turn Spin entry, four consecutive 1/4 rolls up, exit upright (K3)

K.1 45 degree up, 2/4pt roll, half loop (inside or outside), full roll down (K3)

K.2 45 degree up, 2/4pt roll, half loop (inside or outside), full roll down, inverted entry (K3)

K.3 45 degree up, 2/2pt roll, half loop (inside or outside), 2/4pt roll down (K3)

K.4 45 degree up, 2/2pt roll, half loop (inside or outside), 2/4pt roll down, inverted entry (K3)

K.5 45 degree up, full roll, half loop (inside or outside), 2/4pt roll down (K3)

K.6 45 degree up, full roll, half loop (inside or outside), 2/4pt roll down, inverted entry (K3)

K.7 45 degree up, 2/2pt roll, half loop (inside or outside), full snap roll down (K4)

K.8 45 degree up, 2/2pt roll, half loop (inside or outside), full snap roll down, inverted entry (K4)

K.9 45 degree up-line from upright, 1/4 roll, knife-edge half loop (up or down), three consecutive 1/4 rolls down, exit upright (K4)

K.10 45 degree up-line from upright, 1/4 roll, knife-edge half loop (up or down), three consecutive 1/4 rolls down, exit inverted (K4)

K.11 45 degree up-line from inverted, 1/4 roll, knife-edge half loop (up or down), three consecutive 1/4 rolls down, exit upright (K4)

K.12 45 degree up-line from inverted, 1/4 roll, knife-edge half loop (up or down), three consecutive 1/4 rolls down, exit inverted (K4)

K.13 45 degree up-line from upright, 3/4 roll, knife-edge half loop (up or down), three consecutive 1/4 rolls down, exit upright (K4)

K.14 45 degree up-line from upright, 3/4 roll, knife-edge half loop (up or down), three consecutive 1/4 rolls down, exit inverted (K4)

K.15 45 degree up-line from inverted, 3/4 roll, knife-edge half loop (up or down), three consecutive 1/4 rolls down, exit upright (K4)

K.16 45 degree up-line from inverted, 3/4 roll, knife-edge half loop (up or down), three consecutive 1/4 rolls down, exit inverted (K4)

K.17 45 degree up-line from upright, three consecutive 1/4 rolls, knife-edge half loop (up or down), 1/4 roll down, exit upright (K4)

K.18 45 degree up-line from upright, three consecutive 1/4 rolls, knife-edge half loop (up or down), 1/4 roll down, exit inverted (K4)

K.19 45 degree up-line from inverted, three consecutive 1/4 rolls, knife-edge half loop (up or down), 1/4 roll down, exit upright (K4)

K.20 45 degree up-line from inverted, three consecutive 1/4 rolls, knife-edge half loop (up or down), 1/4 roll down, exit inverted (K4)

K.21 45 degree up-line from upright, three consecutive 1/4 rolls, knife-edge half loop (up or down), 3/4 roll down, exit upright (K4)

K.22 45 degree up-line from upright, three consecutive 1/4 rolls, knife-edge half loop (up or down), 3/4 roll down, exit inverted (K4)

K.23 4 5 degree up-line from inverted, three consecutive 1/4 rolls, knife-edge half loop (up or down), 3/4 roll down, exit upright (K4)

K.24 45 degree up-line from inverted, three consecutive 1/4 rolls, knife-edge half loop (up or down), 3/4 roll down, exit inverted (K4)

K.25 45 degree up-line from upright, 1/4 roll, knife-edge half loop (up or down), 3/4 snap roll down, exit upright (K5)

K.26 45 degree up-line from upright, 1/4 roll, knife-edge half loop (up or down), 3/4 snap roll down, exit inverted (K5)

K.27 45 degree up-line from inverted, 1/4 roll, knife-edge half loop (up or down), 3/4 snap roll down, exit upright (K5)

K.28 45 degree up-line from inverted, 1/4 roll, knife-edge half loop (up or down), 3/4 snap roll down, exit inverted (K5)

K.29 45 degree up-line from upright, 3/4 roll, knife-edge half loop (up or down), 3/4 snap roll down, exit upright (K5)

K.30 45 degree up-line from upright, 3/4 roll, knife-edge half loop (up or down), 3/4 snap roll down, exit inverted (K5)

K.31 45 degree up-line from inverted, 3/4 roll, knife-edge half loop (up or down), 3/4 snap roll down, exit upright (K5)

K.32 45 degree up-line from inverted, 3/4 roll, knife-edge half loop (up or down), 3/4 snap roll down, exit inverted (K5)

L.1 Humpty bump (pull, pull, push) half roll up, 2/4pt roll down (K3)

L.2 Humpty bump (push, push, pull) half roll up, 2/4pt roll down, inverted entry (K3)

L.3 Humpty bump (pull, pull, pull) half roll up, 2/2pt roll down (K3)

L.4 Humpty bump (push, push, push) half roll up, 2/2pt roll down, inverted entry (K3)

L.5 Humpty bump (pull, pull, push) 2/4pt roll up, half roll down (K3)

L.6 Humpty bump (push, push, pull) 2/4pt roll up, half roll down, inverted entry (K3)

L.7 Humpty bump (pull, pull, push, or pull, push, push) 1/4 roll up, 3/4 roll down (K3)

L.8 Humpty bump (push, pull, pull, or push, push, pull) 1/4 roll up, 3/4 roll down, inverted entry (K3)

L.9 Humpty bump (pull, pull, pull) 3/4pt roll up, 1/4 roll down (K3)

L.10 Humpty bump (push, pull, pull) 3/4pt roll up, 1/4 roll down, inverted entry (K3)

L.11 Humpty bump with roll options, (half roll up or 1/4 roll up and down) (K2)

L.12 Humpty bump with roll options, (half roll up or 1/4 roll up and down) inverted entry (K2)

M.1 Humpty bump from top, half roll down (push, push, push) (K3)

M.2 Humpty bump from top, half roll down, inverted entry (pull, pull, pull) (K2)

M.3 Humpty bump from top, 2/4pt roll down, half roll up (push, push, pull) (K3)

M.4 Humpty bump from top, 2/4pt roll down, half roll up, inverted entry (pull, pull, push) (K3)

M.5 Humpty bump from top, 2/4pt roll down, 2/2pt roll up (push, push, push) (K3)

M.6 Humpty bump from top, 2/4pt roll down, 2/2pt roll up, inverted entry (pull, pull, pull) (K3)

M.7 Humpty bump from top, 1/4 roll down, 3/4 roll up (push, push, push) (K3)

M.8 Humpty bump from top, 1/4 roll down, 3/4 roll up, inverted entry (pull, push, push) (K3)

M.9 Humpty bump from top, 1/4 roll down, 3/4 roll up, inverted entry and exit (pull, push, pull) (K3)

M.10 Humpty bump from top, 1/4 roll down, 3/4 roll up, inverted exit (push, push, pull) (K3)

N.1 Half Square Loop on Corner from upright up with 1/4 roll on first leg, 1/4 roll on second leg, exit upright (K3)

N.2 Half Square Loop on Corner from upright up with 1/4 roll on first leg, 1/4 roll on second leg, exit inverted (K3)

N.3 Half Square Loop on Corner from inverted up with 1/4 roll on first leg, 1/4 roll on second leg, exit upright (K3)

N.4 Half Square Loop on Corner from inverted up with 1/4 roll on first leg, 1/4 roll on second leg, exit inverted (K3)

N.5 Half Square Loop on Corner from upright down with 1/4 roll on first leg, 1/4 roll on second leg, exit upright (K3)

N.6 Half Square Loop on Corner from upright down with 1/4 roll on first leg, 1/4 roll on second leg, exit inverted (K3)

N.7 Half Square Loop on Corner from inverted down with 1/4 roll on first leg, 1/4 roll on second leg, exit upright (K3)

N.8 Half Square Loop on Corner from inverted down with 1/4 roll on first leg, 1/4 roll on second leg, exit inverted (K3)

N.9 Half Square Loop on Corner from upright up with snap roll on first leg, snap roll on second leg, exit inverted (K5)

N.10 Half Square Loop on Corner from inverted up with snap roll on first leg, snap roll on second leg, exit upright (K5)

N.11 Half Square Loop on Corner from upright down with snap roll on first leg, snap roll on second leg, exit inverted (K5)

N.12 Half Square Loop on Corner from inverted down with snap roll on first leg, snap roll on second leg, exit upright (K5)

N.13 Half Square Loop on Corner from upright up with 11/4 snap roll on first leg, 3/4 roll on second leg, exit upright (K5)

N.14 Half Square Loop on Corner from upright up with 11/4 snap roll on first leg, 3/4 roll on second leg, exit inverted (K5)

N.15 Half Square Loop on Corner from inverted up with 11/4 roll on first leg, 3/4 roll on second leg, exit upright (K5)

N.16 Half Square Loop on Corner from inverted up with 11/4 roll on first leg, 3/4 roll on second leg, exit inverted (K5)

N.17 Half Square Loop on Corner from upright down with 11/4 roll on first leg, 3/4 roll on second leg, exit upright (K5)

N.18 Half Square Loop on Corner from upright down with 11/4 roll on first leg, 3/4 roll on second leg, exit inverted (K5)

N.19 Half Square Loop on Corner from inverted down with 11/4 roll on first leg, 3/4 roll on second leg, exit upright (K5)

N.20 Half Square Loop on Corner from inverted down with 11/4 roll on first leg, 3/4 roll on second leg, exit inverted (K5)

N.21 Half Square Loop on Corner from upright up with 11/4 snap roll on first leg, 11/4 snap roll on second leg, exit upright (K5)

N.22 Half Square Loop on Corner from upright up with 11/4 snap roll on first leg, 11/4 snap roll on second leg, exit inverted (K5)

N.23 Half Square Loop on Corner from inverted up with 11/4 roll on first leg, 11/4 snap roll on second leg, exit upright (K5)

N.24 Half Square Loop on Corner from inverted up with 11/4 roll on first leg, 11/4 snap roll on second leg, exit inverted (K5)

N.25 Half Square Loop on Corner from upright down with 11/4 roll on first leg, 11/4 snap roll on second leg, exit upright (K5)

N.26 Half Square Loop on Corner from upright down with 11/4 roll on first leg, 11/4 snap roll on second leg, exit inverted (K5)

N.27 Half Square Loop on Corner from inverted down with 11/4 roll on first leg, 11/4 snap roll on second leg, exit upright (K5)

N.28 Half Square Loop on Corner from inverted down with 11/4 roll on first leg, 11/4 snap roll on second leg, exit inverted (K5)

P.1 Vertical 5/8 loop from upright, snap-roll, half roll, exit upright (K4)

P.2 Vertical 5/8 loop from upright, snap-roll, roll, exit inverted (K4)

P.3 Vertical 5/8 loop from inverted, snap-roll, roll, exit upright (K4)

P.4 Vertical 5/8 loop from inverted, snap-roll, half roll, exit inverted (K4)

P.5 Vertical 5/8 loop from top upright, snap-roll, half roll, exit upright (K4)

P.6 Vertical 5/8 loop from upright, snap-roll, roll, exit inverted (K4)

P.7 Vertical 5/8 loop from top inverted, snap-roll, roll, exit upright (K4)

P.8 Vertical 5/8 loop from top inverted, snap-roll, half roll, exit inverted (K4)

P.9 Vertical 5/8 loop from upright, 3/4 snap-roll, 1/4 roll, exit upright (K4)

P.10 Vertical 5/8 loop from upright, 3/4 snap-roll, 1/4 half roll, exit inverted (K4)

P.11 Vertical 5/8 loop from inverted, 3/4 snap-roll, 1/4 half roll, exit upright (K4)

P.12 Vertical 5/8 loop from top inverted, 3/4 snap-roll, 1/4 half roll, exit upright (K4)

Q1 Almost 8. From bottom upright, pulled half loop with roll integrated, pushed half loop with roll integrated, pushed half loop with roll integrated, exit middle inverted (K5)

Q.2 Almost 8. From bottom upright, pulled half loop, pushed half loop with 1/2 roll integrated, pulled half loop, exit middle upright (K4)

Q.3 Almost 8. From top upright, pushed half loop with roll integrated, pulled half loop with roll integrated, pulled half loop with roll integrated, exit middle inverted (K5)

Q.4 Almost 8. From top upright pushed, half loop, pulled half loop with 1/2 roll integrated, pushed half loop, exit middle upright (K4)

Q.5 Almost 8. From middle inverted, pushed half loop with roll integrated, pushed half loop with roll integrated, pulled half loop with roll integrated, exit bottom upright (K5)

Q.6 Almost 8. From middle upright, pulled half loop, pulled half loop with 1/2 roll integrated, pulled half loop, exit bottom upright (K4)

Q.8 Almost 8. From middle inverted, pulled half loop with roll integrated, pulled half loop with roll integrated, pushed half loop with roll integrated, exit top upright (K5)

Q.9 Almost 8. From middle upright, pushed half loop, pushed half loop with 1/2 roll integrated, pushed half loop, exit top upright (K4)