



431 (AD) SQN 2024 Flat Show

1. The following is a pictorial description of the proposed 2023 Flat Show
2. Maneuvers have been classified as follows:
 -  – Permitted Maneuvers as per BGA 100 Ch 14
 -  – Permitted Maneuvers requiring Comd approval as per BGA 100 Ch 14

Approval

Canadian Air Division Approval is granted following a successful private acceptance show demonstration at the end of Snowbirds annual spring training. FAA NAES, or designate, will be invited to attend the acceptance show to review demonstration for pending approval or attend first practice in the USA.



Airspace Requirements

In **Canada**, the Snowbirds request a 10 nautical mile (NM) radius centred on Show Centre with a height of 7,500 feet Above Ground Level (AGL). While a 10 NM radius is preferred, reduced airspace dimensions may be accepted at the discretion of Snowbird 1, the Team Lead. If reduced restricted airspace dimensions are required, organizers are to contact the team for approval and carbon-copy 1 Canadian Air Division.

In the **United States**, the Snowbirds request a 7NM radius centred on Show Centre, and can accept a reduction to 5NM if required.

The ground tracks depicted herein represent the general flow of the main formation, solos, and specialties formations as applicable. Modification of these ground tracks remains at the discretion of Snowbird 1, while retaining the intended flow. Additionally, Snowbird 1 maintains the ability to omit any sequences laid out in this manoeuvres package in order to meet the desired conclusion for any show.



The weather limits for each of the Snowbirds performances are:

High Show	5000 feet ceiling and 5 statute miles visibility
Low show	1500 feet ceiling and 5 statute miles visibility
Flat Show	1000 feet and 5 statute miles visibility

The BGA-100 requires a minimum visibility of three statute miles for any air displays. The Snowbirds have raised the minimum visibility of the high and low show displays as an added safety measure due to the complexity of the rejoins post splits.

Sterile Air Display Area

The Snowbirds require a sterile area (no persons other than essential personnel are allowed into this area, known as the Sterile Air Display Area, SADA) as detailed in the diagram below. Security personnel must block access roads that may enter or cross this area. Any buildings that lie within this area must be vacant. These measures must be in place prior to the Snowbirds performing. This includes all practice days as well as performances. This SADA is often referred to as the “Show Box.” **The standard SADA dimensions are depicted below with the Show Line placement at 1,500 feet front or back, which can be waived to 1,200 feet with 1 CAD (and FAA in the USA) approval for a total of 2,700 feet.** The markers used to display the Show Line must be discernible at least 2 SM from Show Centre at an altitude of 300’ AGL. The Crowd left and Crowd Right markers must be clearly visible from the highest altitude required by the applicable team.

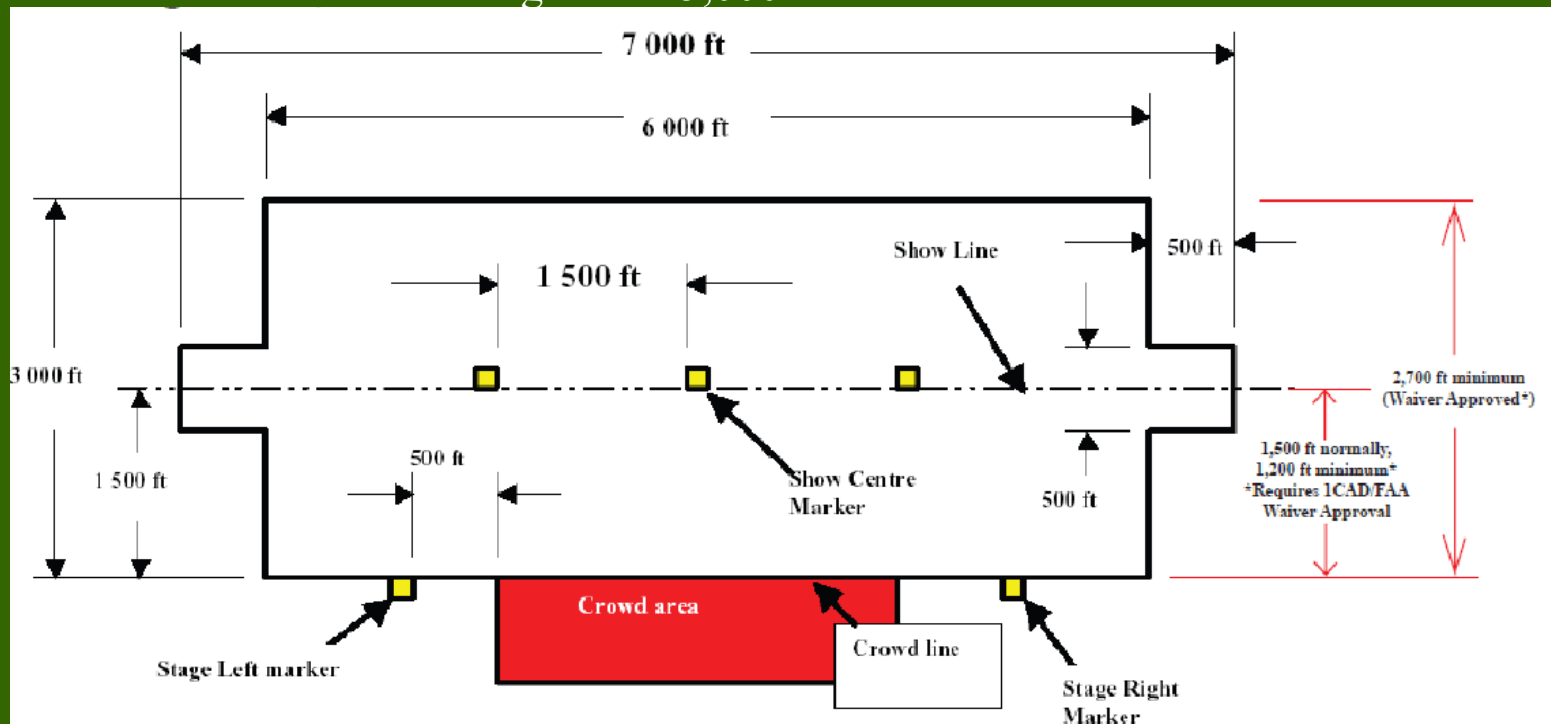
There are five markers as designated in the image below.

One marker at Show Centre, situated on the Show Line at the centre of the Show Box;

Two Markers on the Show Line, each approximately 1,500 ft either side of the Show Centre marker. (If is not geographically possible to locate each one 1,500 ft from the Show Centre marker, they need to be at least equidistant);

Stage Left and Stage Right Markers a minimum of 500 ft from the left and right edges of the crowd line;

The barrier defining the Crowd Line must not be closer than 500 ft from the closest active runway. As our Aircraft occasionally manoeuvre to the rear of the crowd, the Crowd Line shall be no longer than 5,000 ft.





Aerobatic Manoeuvring

The Majority of Snowbird aerobatic manoeuvring takes place within the Sterile Air Display Area (SADA) commencing no lower than 300' AGL and apexing no higher than 1,500' AGL (Low Show) and 4,500' AGL (High Show) respectively. Aerobatic manoeuvring which takes place outside the SADA (such as the Heart) commence no lower than 500' AGL and become aerobatic passing 1,500' AGL. Additionally, some show sites have built-up areas near the SADA that underlie flight paths depicted herein. To maintain safe and scripted flows as described below, on occasion aerobatic manoeuvring above 1,500' AGL and over built-up areas would be required, as permitted in the BGA 100 with Comd 1 Cdn Air Div approval. In three instances aerobatic manoeuvring will take place outside SADA between 500' AGL and 1,500' AGL and is permitted in Canada with Comd approval. These manoeuvres are:

Twizzle - Snowbirds 8 and 9 execute single point rolls prior to crossing and into onto the Show Line;
Lagback Cross - Snowbird 7 executes two barrel rolls prior to calling the splits and
Battle of Britain - All Snowbirds approach the SADA in trail formation (300-2,000' AGL), individually manoeuvring towards the Show Line. Aircraft may be manoeuvring acrobatically prior to paralleling the Show Line in preparation for landing.

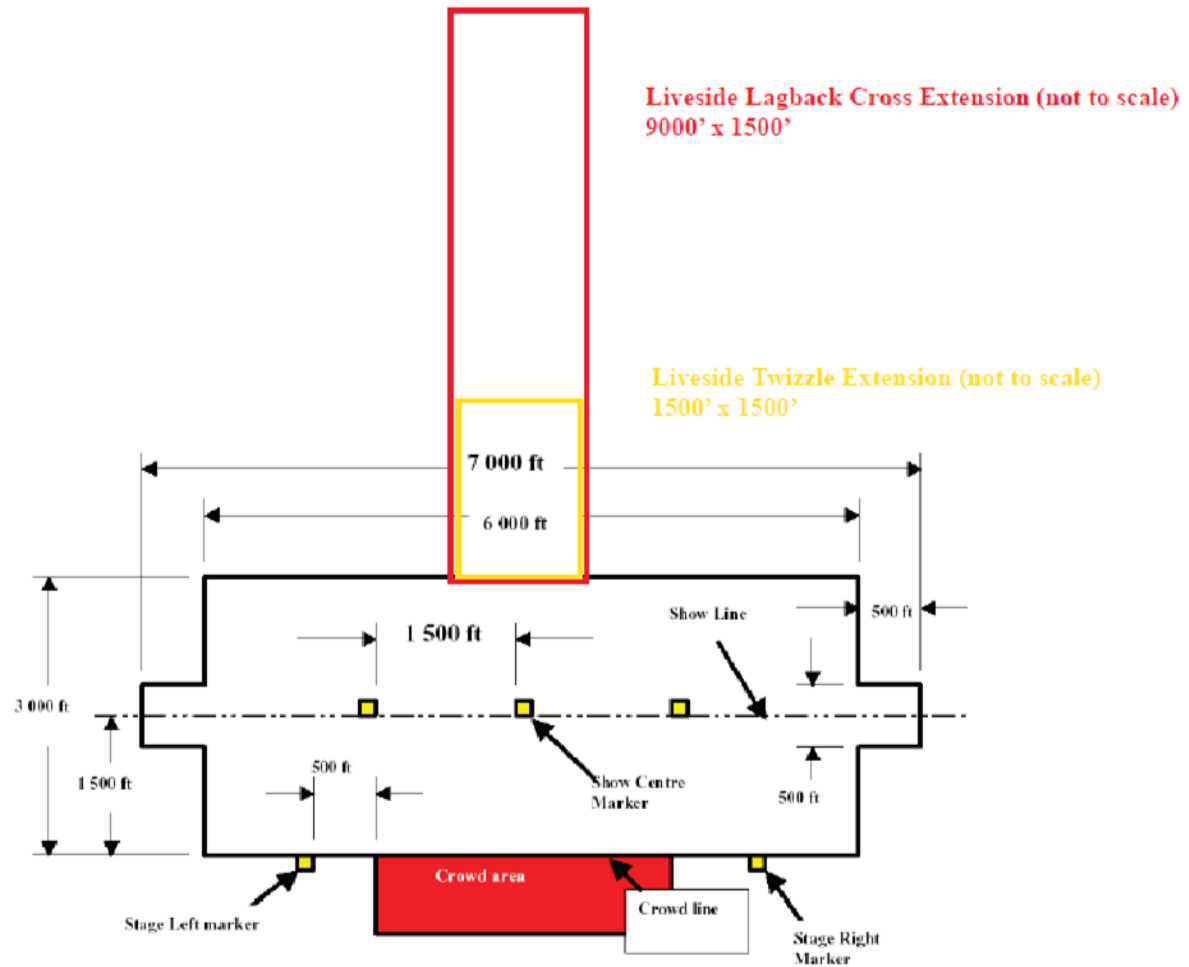
Airspeeds

During the performance, the minimum entry and exit airspeed are 100 KIAS and the maximum entry speed is 300 KIAS. Pressure and Density Altitude calculations may require padding on both airspeeds for added safety.



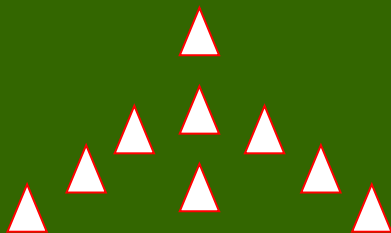
Operations in the United States

In the United States, the Canadian approved SADA will need to be modified in order to accommodate the Twizzle Roll and the Lagback Cross. While in the United States, the Battle of Britain, if flown, will be flown in such a way to remain non-aerobatic. Aircraft will not barrel roll but will instead manoeuvre fluidly remaining non-aerobatic. To accommodate the Twizzle Roll and the Lagback Cross, a liveside sterile corridor/extension, 1,500' wide and 9,000' long (as depicted below) will need to be added to the Canadian SADA. If the sterile corridor can only be 1,500' by 1,500', then the Twizzle roll can still be flown. If a liveside sterile corridor cannot be generated, the Lagback Cross and the Twizzle Roll will be modified and flown in a non-aerobatic manner. Coordination between air display organizer, local FAA Flight Standards District Offices (FSDO) and the Snowbirds will occur to determine which sterile which sterile air display area will be used and manoeuvres will be flown accordingly.

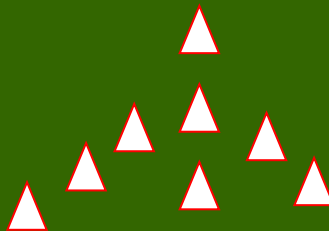


Contingency Plan

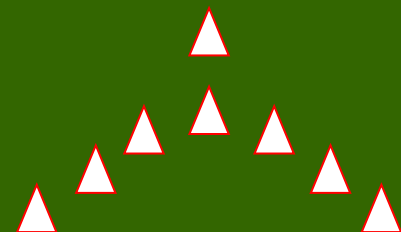
A detailed strategy for the loss of each position is pre-planned by the Snowbird Training Officer and briefed to all team members as part of Spring Training. During each show pre-brief a simulated emergency is conducted leading to a missing player scenario which is then refreshed to all teammates. In the event someone has to land before the end of the show, the specific missing player plan encountered is verbally briefed on the team common radio frequency. In all cases, Snowbird missing player philosophy is that the inside missing player's position will be filled for aesthetics, but for more demanding manoeuvres, i.e. splits or bursts, players will remain in their natural position with a "ghost" aircraft in between them and lead. A single solo show will encompass show line manoeuvring without crosses.



All Players



Missing Right Inner



Missing Line A
Stern



Ingressing/Egressing the SADA

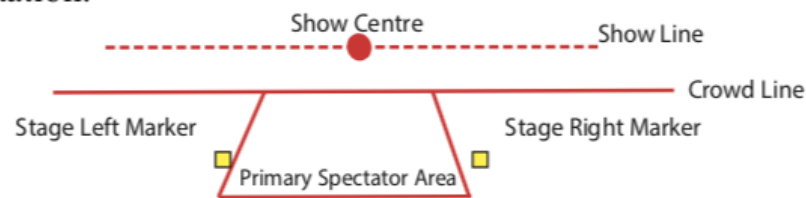
When ingressing towards the SADA, all Snowbirds ingress altitudes shall be a minimum of 500' AGL above the highest obstacle along the aircraft track. Similarly, when egressing the SADA, all Snowbird egress altitudes shall be a minimum of 500' AGL to climbing. When there is a need to ensure safe separation between formation elements egressing the SADA and those awaiting ingress, altitude blocks are pre-briefed accordingly.

Primary Spectator Area (PSA)

All Snowbird aerobatic manoeuvring shall take place a minimum of 1,500 ft (Show Line) laterally from the Crowd Line. Airspace in front of the crowd is referred to as “liveside” while airspace behind the Crowd Line (i.e. behind the crowd when they are looking toward the Show Line) is referred to as “deadside.” All aircraft exiting towards the crowd deadside shall maintain a minimum lateral separation of 500 ft (Stage Markers) from the left/right physical boundaries of the PSA.

On Occasion, Snowbird aircraft require flight directly over the PSA when entering/exiting the Sterile Air Display Area Pending Comd Approval of these permitted manoeuvres (per BGA 100 Ch 11), all aircraft shall fly no lower than 500’AGL overhead the crowd in a wings level or level to climbing orientation.

The PSA, Show Line, Show Centre and Stage left/Right Markers will be depicted as follows throughout this presentation.





Air Display Flight

Snowbird 1 – Major Brent Handy, *Team Lead*

Snowbird 2 – Capt Caitlin Clapp, *Inner Right Wing*

Snowbird 3 – Major Steven Timm, *Inner Left Wing*

Snowbird 4 – Capt Scott Boyd, *First Line Astern*

Snowbird 5 – Capt Thomas Thornton, *Second Line Astern*

Snowbird 6 – Capt Kyle Taylor, *Outer Right Wing*

Snowbird 7 – Capt Dominic Appolloni, *Outer Left Wing*

Snowbird 8 – Capt Marc-Andre Plante, *Lead Solo*

Snowbird 9 – Capt Patrice Powis-Clement, *Opposing Solo*

Snowbird 10 – Capt Edward Soye, *Coordinator*

Snowbird 11 – Capt Richard MacDougall, *Coordinator*



PRIMARY SPECTATOR AREA



STAGE RIGHT

1500' SHOWLINE

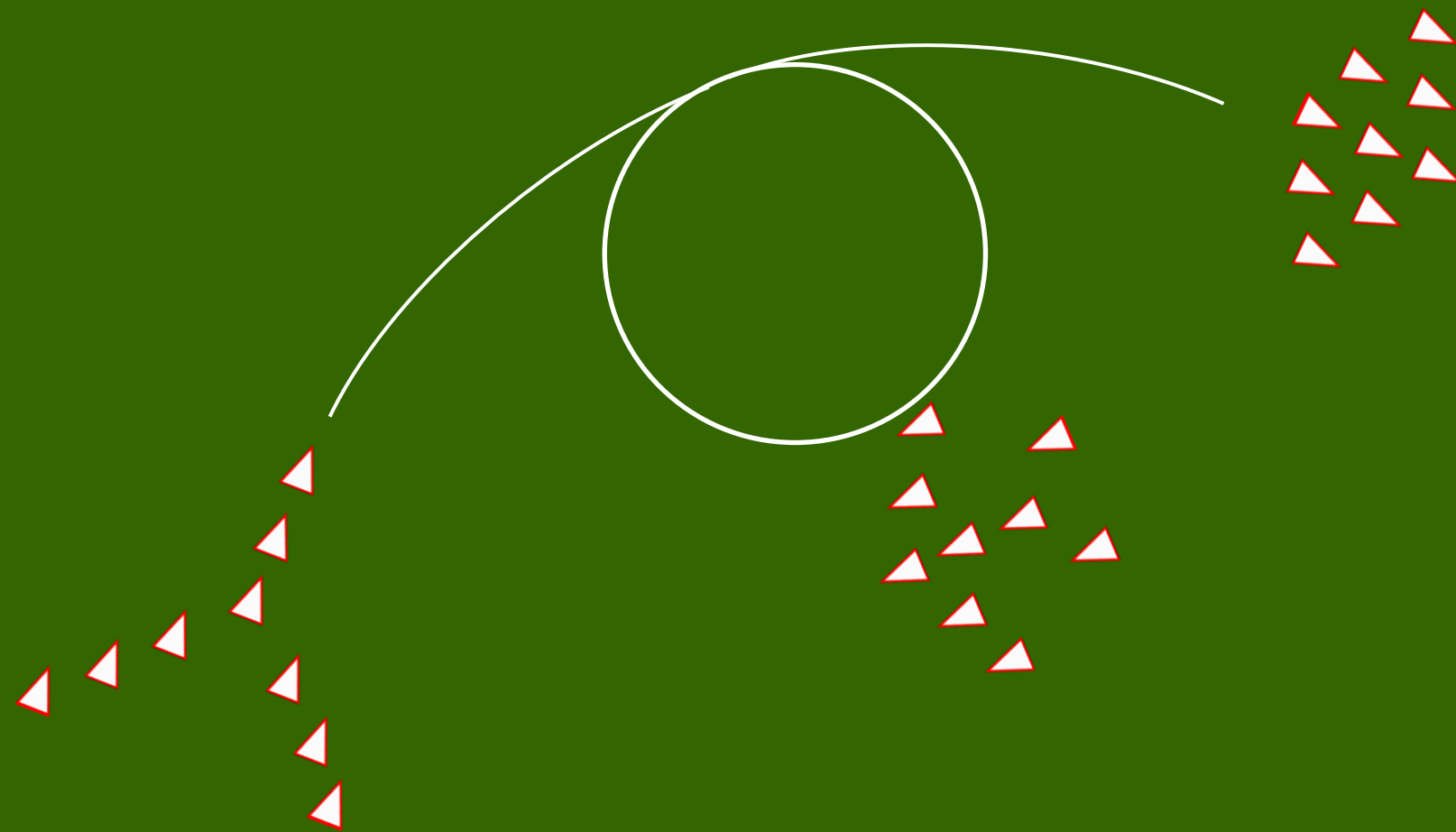
STAGE LEFT

431 (AD) SQN 2024 Flat Show

Overhead pictorial with top-side and underside depictions.

Running in from liveside stage right, the Snowbirds enter a wrap in Canada Goose, before changing to Big Arrow and thereafter Big Diamond. The Team Continues out stage left, changing to Condor UDL

This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for non aerobatic manoeuvre by multiple aircraft in formation with an energy vector toward the primary spectator area. BGA 100 Ch 14 Para 44.c(1)(c)

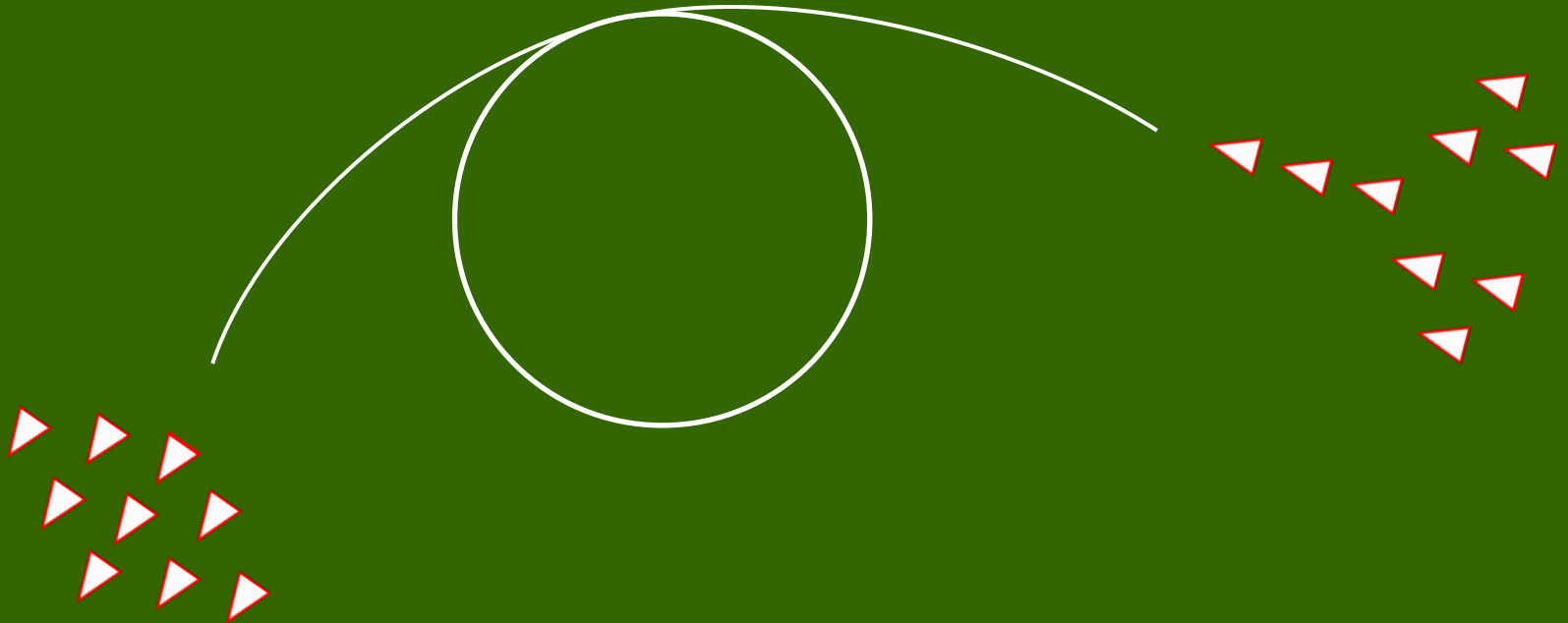


Canada Goose Δ Big Diamond Wrap UDL

Running in from stage left, the Snowbirds enter for the Condor bottom side, before entering a left-hand wrap, thereafter changing to Big Diamond. The Team continues out stage right, UDR.



This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for non aerobatic manoeuvre by multiple aircraft in formation with an energy vector toward the primary spectator area. BGA 100 Ch 14 Para 44.c(1)(c)

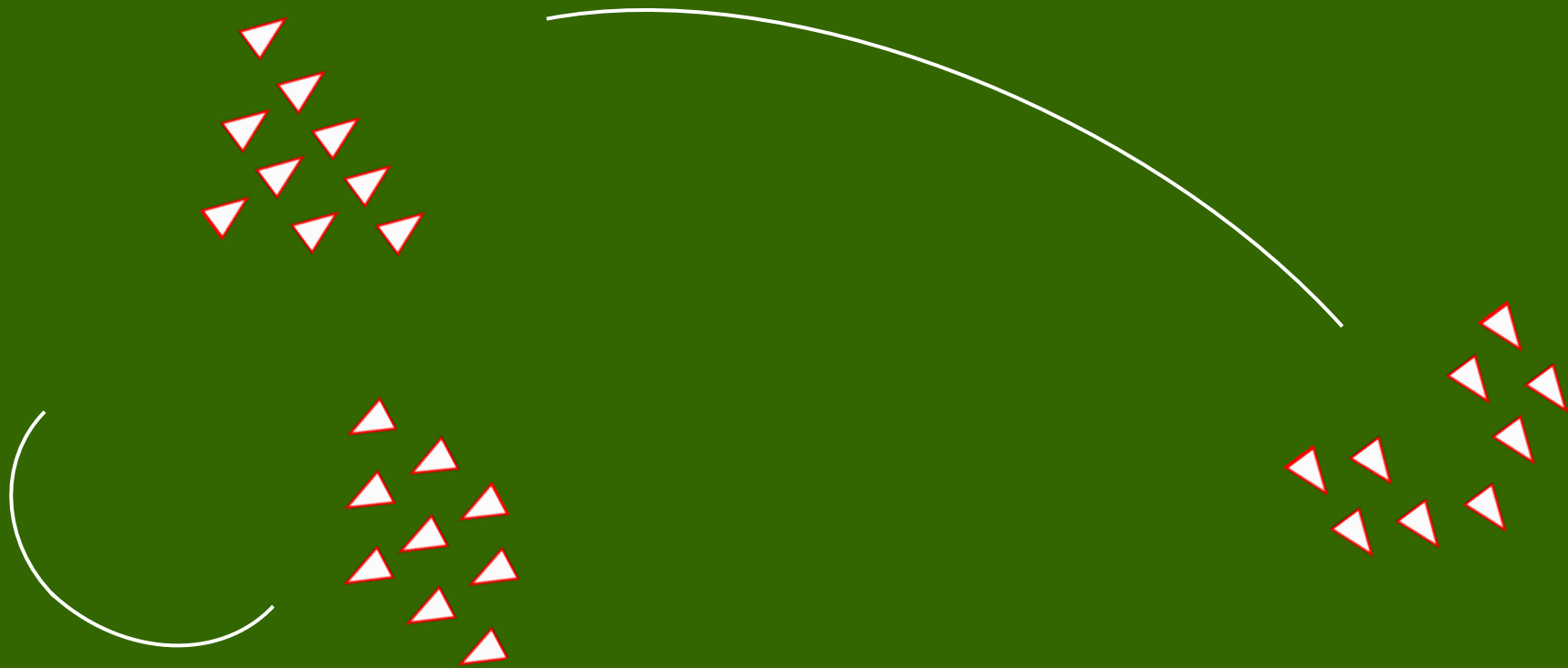


Condor Δ Big Diamond Wrap

Running in from stage right, the Snowbirds enter for the Inverted Wedge bottom side, before continuing out liveside stage left, changing to Big Vic, and thereafter 9 Plane Line Abreast.



This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for non aerobatic manoeuvre by multiple aircraft in formation with an energy vector toward the primary spectator area. BGA 100 Ch 14 Para 44.c(1)(c)

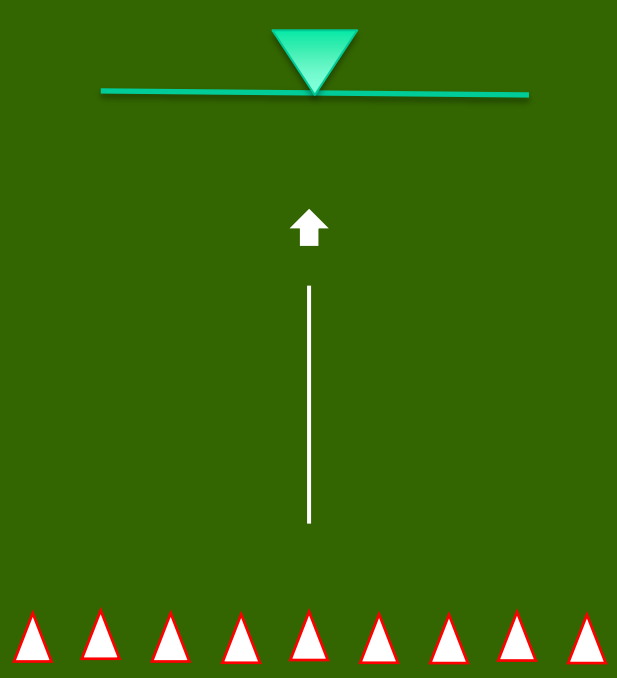


Inverted Wedge Bottom Side

Following the Solo rejoin, the Team changes into Big Vic, and thereafter 9 Plane Line Abreast. From Liveside, the team flies directly over stage centre, before continuing deadside.

1000 ft

This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for over-flight of the primary spectator area at 500 feet. BGA 100 Ch 14 Para 44.b(3)(e)

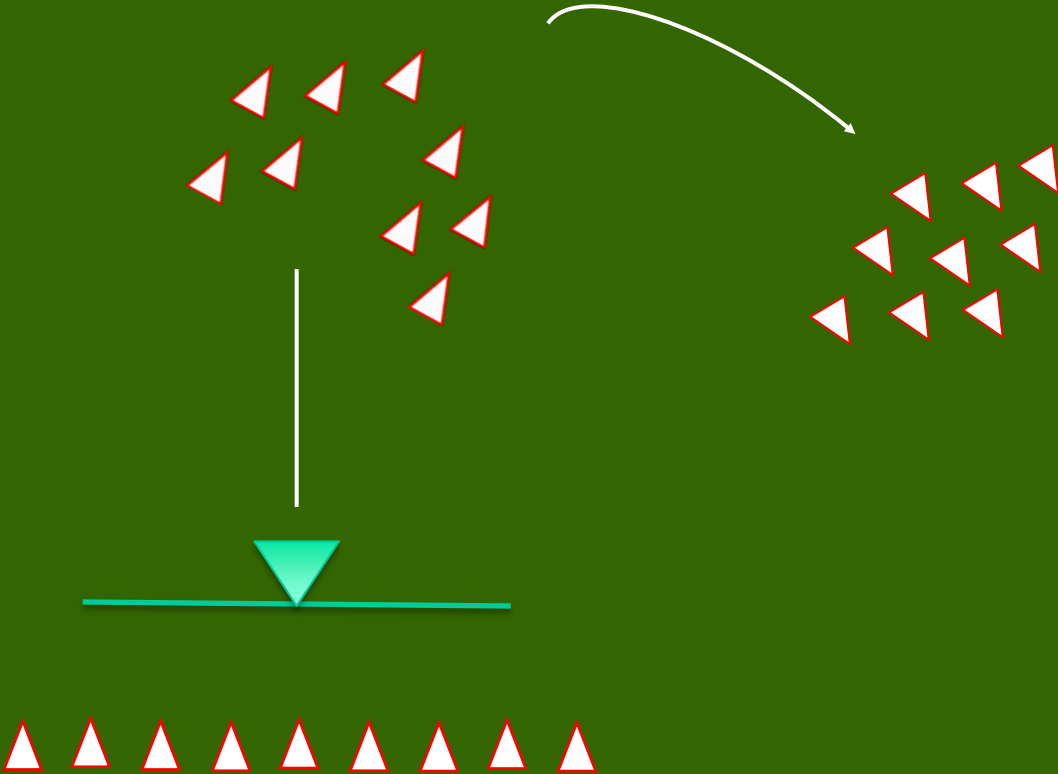


9 Plane Line Abreast

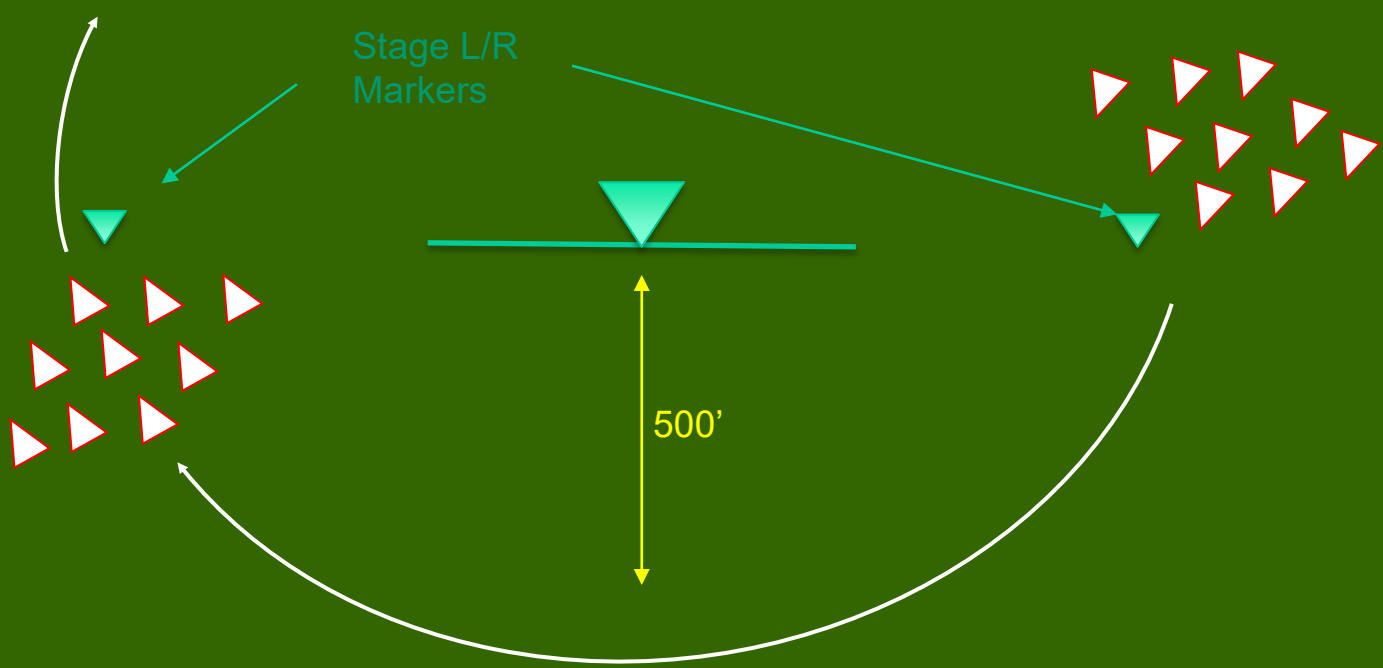
Once Deadside, the team changes to Palm, and thereafter Big Diamond, to set up for the Big Diamond Topside.



This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for over-flight of the primary spectator area at 500 feet. BGA 100 Ch 14 Para 44.b(3)(e)



9 Plane Line Abreast



From deadside stage left, the Team flies past for the Big Diamond topside (respecting the stage left and right corner markers and minimum 500' from Primary Spectator Area.)

Big Diamond Topside

Encore

Pending show site, transit fuel and WX considerations, After Big Diamond Topside, Snowbird 1 will finish the show with Battle of Britain.

In the event that this is flown as a Non-Aerobatic Display (NAD), where weather and terrain are not a factor, Snowbird 1 may elect to finish the performance with a Maple Split, or the Palm Outward to land.



431 (AD) SQN 2024 High Show

1. The following is a pictorial description of the proposed 2024 High Show
2. Maneuvers have been classified as follows:

-  – Permitted Maneuvers as per BGA 100 Ch 14
-  – Permitted Maneuvers requiring Comd approval as per BGA 100 Ch 14

Approval

Canadian Air Division Approval is granted following a successful private acceptance show demonstration at the end of Snowbirds annual spring training. FAA NAES, or designate, will be invited to attend the acceptance show to review demonstration for pending approval or attend first practice in the USA.



Airspace Requirements

Canada

10 nm

Surface to 7,500' AGL

*May be reduced at discretion of Snowbird 1

United States

7nm

Surface to 7,500' AGL

*May be reduced at discretion of Snowbird 1

The ground tracks depicted herein represent the general flow of the main formation, solos, and specialties formations as applicable.

Modification of these ground tracks remains at the discretion of Snowbird 1, while retaining the general flow.

Snowbird 1 maintains the ability to omit any sequences laid out in this manoeuvres package in order to meet the desired conclusion for any show.



Minimum Weather:

High Show	5000 feet ceiling and 5 statute miles visibility
Low show	1500 feet ceiling and 5 statute miles visibility
Flat Show	1000 feet and 5 statute miles visibility

The BGA-100 requires a minimum visibility of three statute miles for any air displays. The Snowbirds have raised the minimum visibility of the high and low show displays as an added safety measure due to the complexity of the rejoins post splits.

* A hybrid 'Low Show with High Reversals' may be flown with a minimum ceiling of 3000' AGL (solos fly Cuban reversals and SB1 leads the Double Diamond Roll)

Sterile Air Display Area

- essential personnel only within SADA during airshows
- buildings within SADA must be vacant
- event organizer must ensure SADA can be cleared for airshows
- standard Cat 1 showline is 1500' but minimum of 1200' for specific exceptions

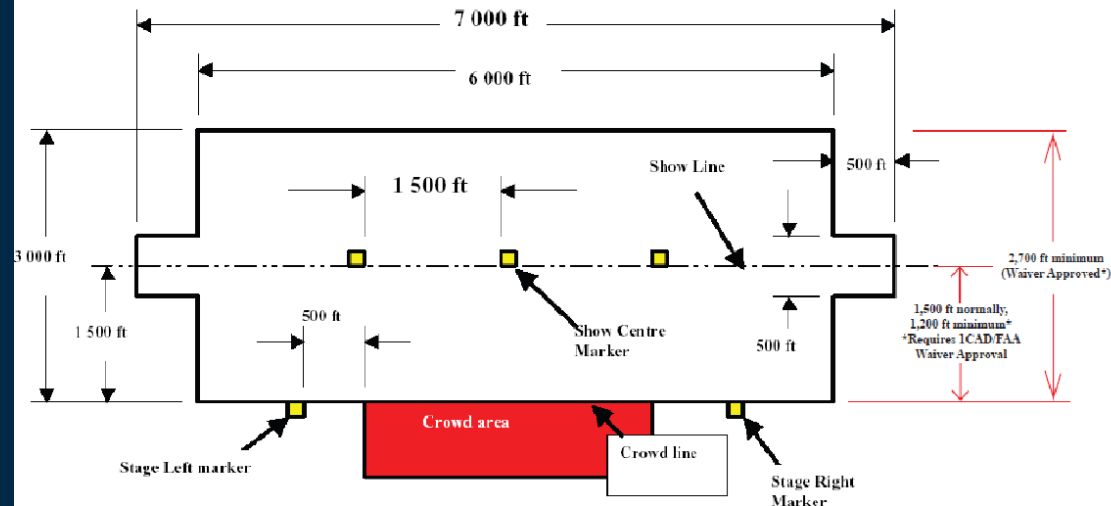
There are five markers as designated in the image below:

One marker at Show Centre, situated on the Show Line at the centre of the Show Box;

Two markers on the Show Line, each approximately 1,500 ft either side of the Show Centre marker. (If it is not geographically possible to locate each one 1,500 ft from the Show Centre marker, they need to be at least equidistant);

Stage Left and Stage Right Markers a minimum of 500 ft from the left and right edges of the Crowd Line;

The barrier defining the Crowd Line must not be closer than 500 ft from the closest active runway. As our aircraft occasionally manoeuvre to the rear of the crowd, the Crowd Line shall be no longer than 5,000 ft.





Aerobic Manoeuvring

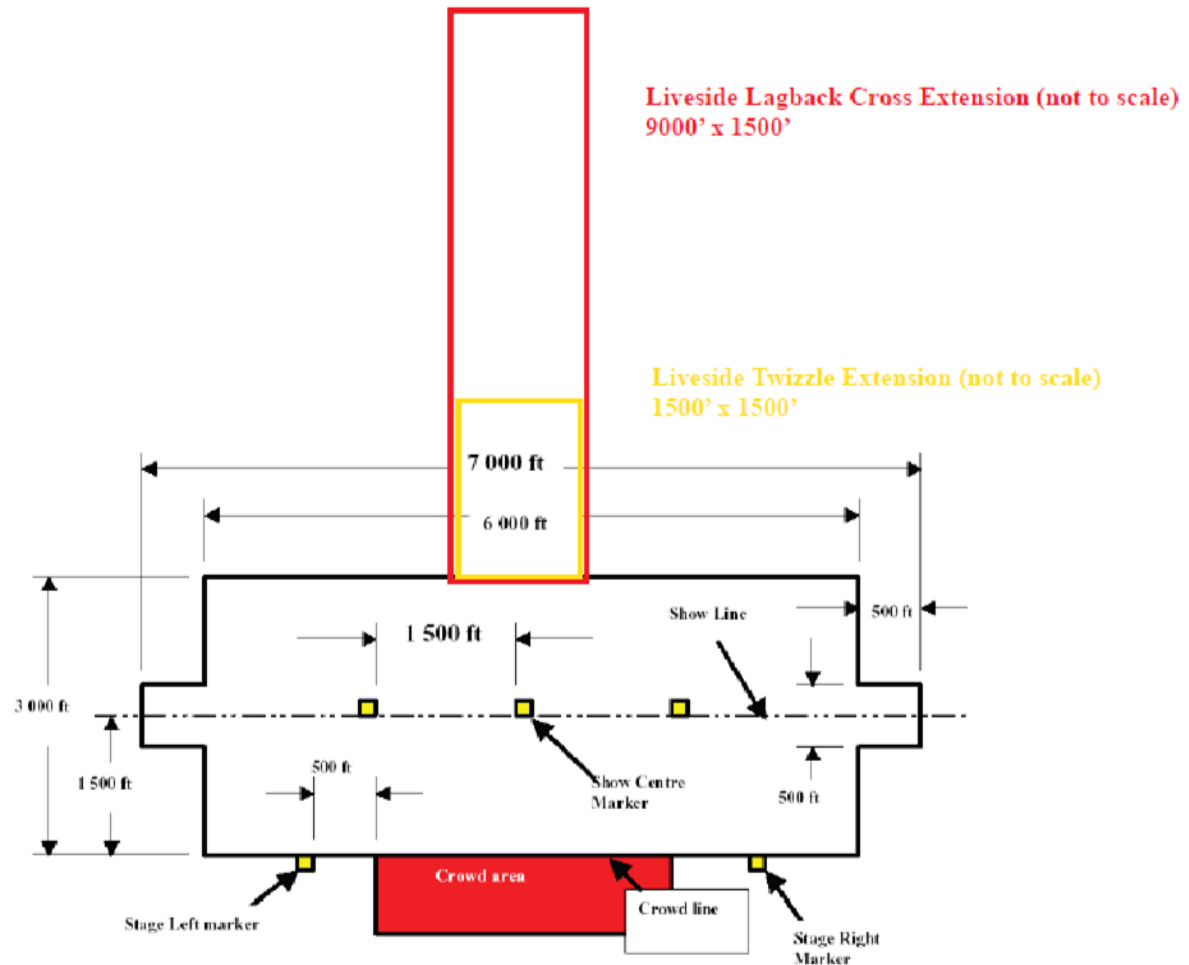
- Majority of aerobatic maneuvering occurs in SADA
- Minimum altitude 300' AGL
- Minimum airspeed 100 KIAS, Maximum airspeed 300 KIAS (+/- for density altitude adjustment)
- Certain maneuvers* outside the SADA commence 500' AGL and become aerobatic above 1500' AGL
 - Heart
 - Twizzle Roll
 - Lagback Cross

*Per B-GA-100, these maneuvers and others flown over built up areas above 1500' AGL may be permitted with Comd 1 CAD approval (acceptance show)



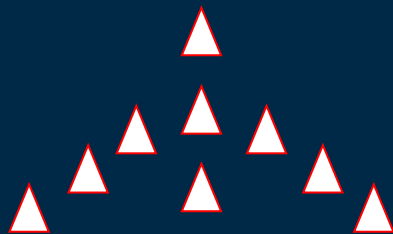
Operations in the United States

In the United States, the Canadian approved SADA will need to be modified in order to accommodate the Twizzle Roll and the Lagback Cross. While in the United States, the Battle of Britain, if flown, will be flown in such a way to remain non-aerobatic. Aircraft will not barrel roll but will instead manoeuvre fluidly remaining non-aerobatic. To accommodate the Twizzle Roll and the Lagback Cross, a liveside sterile corridor/extension, 1,500' wide and 9,000' long (as depicted below) will need to be added to the Canadian SADA. If the sterile corridor can only be 1,500' by 1,500', then the Twizzle roll can still be flown. If a liveside sterile corridor cannot be generated, the Lagback Cross and the Twizzle Roll will be modified and flown in a non-aerobatic manner. Coordination between air display organizer, local FAA Flight Standards District Offices (FSDO) and the Snowbirds will occur to determine which sterile which sterile air display area will be used and manoeuvres will be flown accordingly.

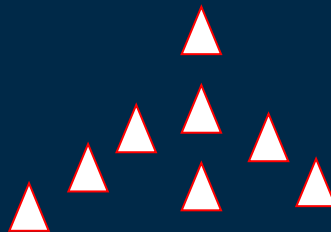


Contingency Plan

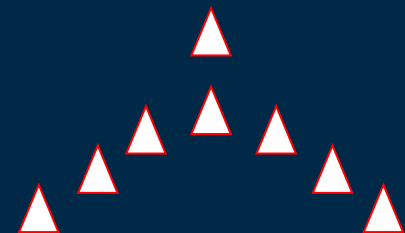
A detailed strategy for the loss of each position is pre-planned by the Snowbird Training Officer and briefed to all team members as part of Spring Training. During each show pre-brief a simulated emergency is conducted leading to a missing player scenario which is then refreshed to all teammates. In the event someone has to land before the end of the show, the specific missing player plan encountered is verbally briefed on the team common radio frequency. In all cases, Snowbird missing player philosophy is that the inside missing player's position will be filled for aesthetics, but for more demanding manoeuvres, i.e. splits or bursts, players will remain in their natural position with a "ghost" aircraft in between them and lead. A single solo show will encompass show line manoeuvring without crosses.



All Players



Missing Right Inner



Missing Line A
Stern



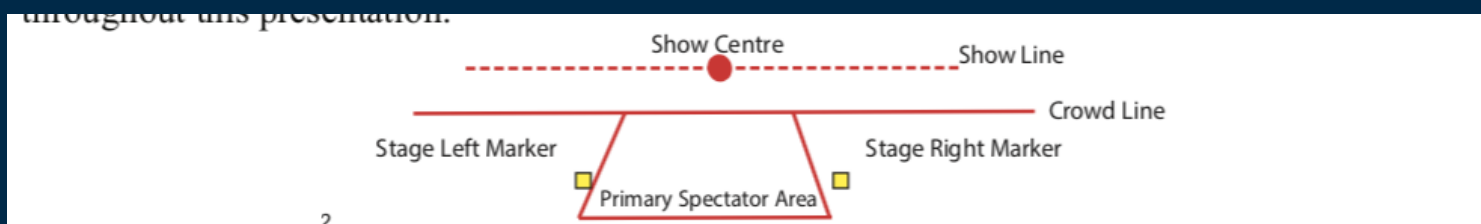
Ingressing/Egressing the SADA

When ingressing towards the SADA, all Snowbirds ingress altitudes shall be a minimum of 500' AGL above the highest obstacle along the aircraft track. Similarly, when egressing the SADA, all Snowbird egress altitudes shall be a minimum of 500' AGL to climbing. When there is a need to ensure safe separation between formation elements egressing the SADA and those awaiting ingress, altitude blocks are pre-briefed accordingly.

Primary Spectator Area (PSA)

Snowbird aerobatic maneuvers are flown on or beyond the Cat 1 (1500') show line

- aircraft exiting towards the crowd deadside shall maintain a minimum lateral separation of 500 ft (Stage Markers) from the left/right physical boundaries of the PSA.
- Snowbird aircraft require flight directly over the PSA when entering/exiting the Sterile Air Display Area Pending Comd Approval of these permitted manoeuvres (per BGA 100 Ch 11), all aircraft shall fly no lower than 500' AGL overhead the crowd in a wings level or level to climbing orientation.





Air Display Flight

Snowbird 1 – Major Brent Handy, *Team Lead*

Snowbird 2 – Capt Caitlin Clapp, *Inner Right Wing*

Snowbird 3 – Major Steven Timm, *Inner Left Wing*

Snowbird 4 – Capt Scott Boyd, *First Line Astern*

Snowbird 5 – Capt Thomas Thornton, *Second Line Astern*

Snowbird 6 – Capt Kyle Taylor, *Outer Right Wing*

Snowbird 7 – Capt Dominic Appolloni, *Outer Left Wing*

Snowbird 8 – Capt Marc-Andre Plante, *Lead Solo*

Snowbird 9 – Capt Patrice Powis-Clement, *Opposing Solo*

Snowbird 10 – Capt Edward Soye, *Coordinator*

Snowbird 11 – Capt Richard MacDougall, *Coordinator*



PRIMARY SPECTATOR AREA

STAGE RIGHT



1500' SHOWLINE

STAGE LEFT

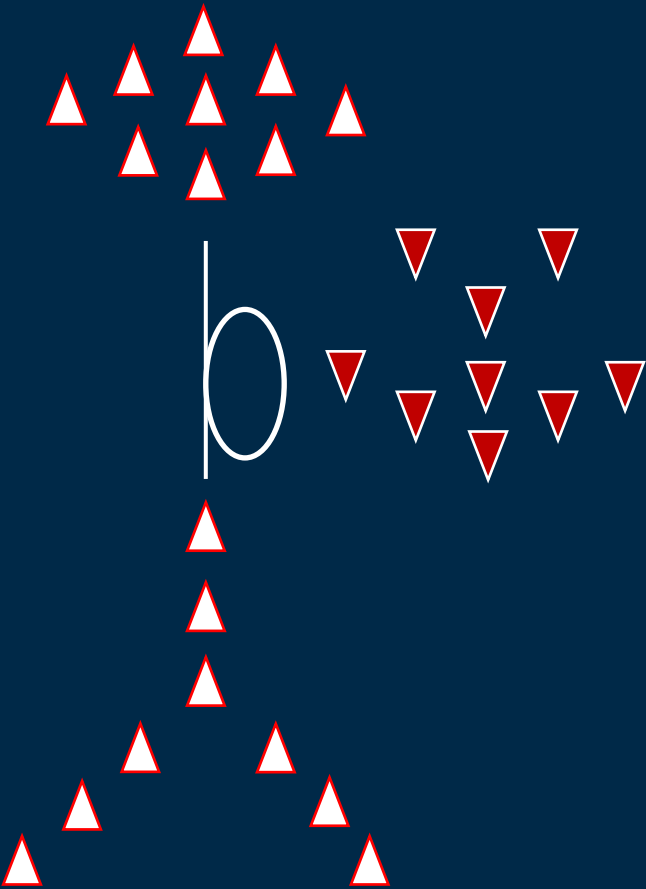
431 (AD) SQN 2024 High Show

Overhead pictorial with top-side and underside depictions.

Running in from liveside, the Snowbirds pull up in the Canada Goose Loop, in the vertical, a change is made to Big Arrow, followed by Big Diamond on the backside



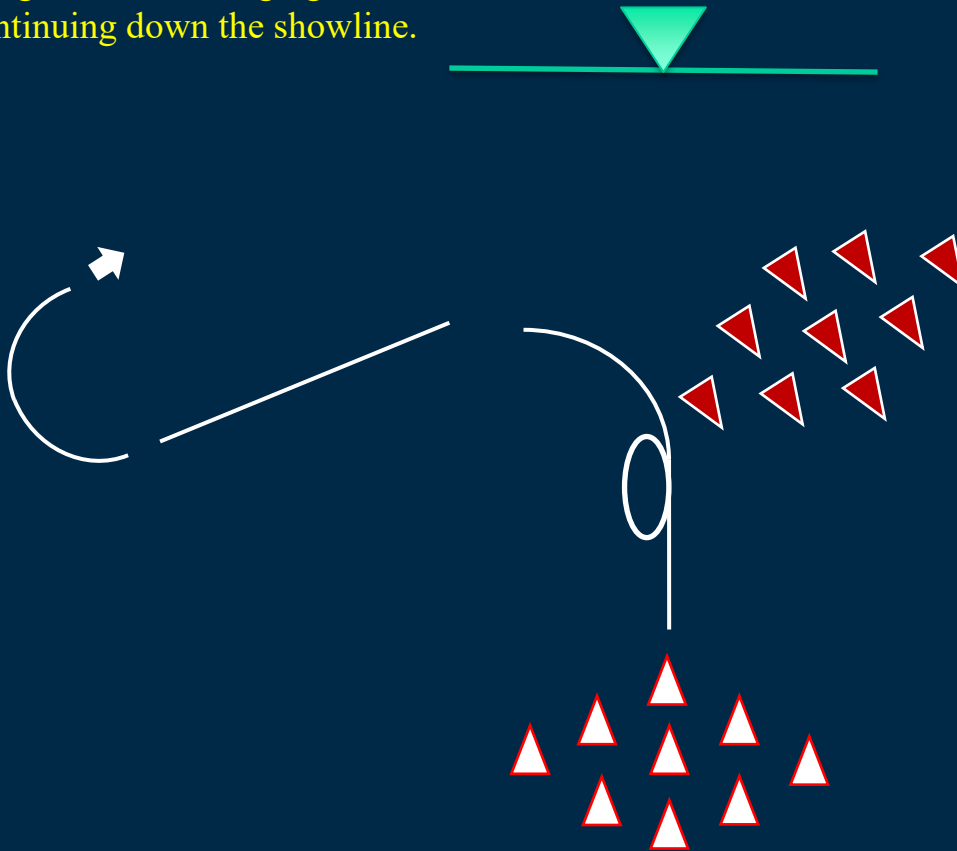
This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for aerobatic manoeuvres which direct an energy vector toward the primary spectator area at any point. BGA 100 Ch 14 Para 44.c(1)(c)



Canada Goose Δ Big Diamond Loop

Continuing from liveside, the Snowbirds pull up in Big Diamond, thereafter commencing a clover downward on the backside, continuing stage right, performing an UDR, changing to Inverted Wedge and continuing down the showline.

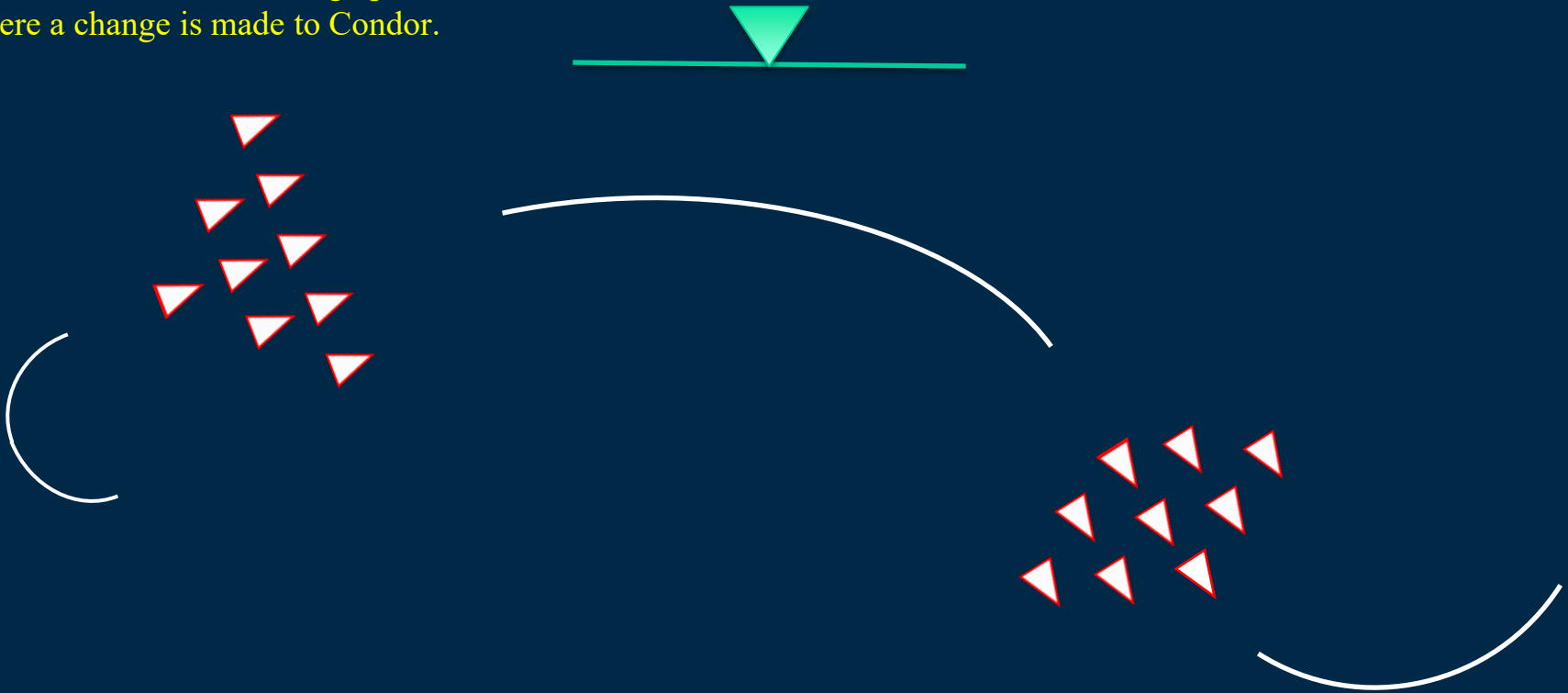
This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for aerobatic manoeuvres which direct an energy vector toward the primary spectator area at any point. BGA 100 Ch 14 Para 44.c(1)(c)



Big Diamond Clover Down

From Stage Right, the Team conducts the Inverted Wedge bottom side. Continuing out liveside stage left the team changes into Big Diamond, before continuing up and down left, where a change is made to Condor.

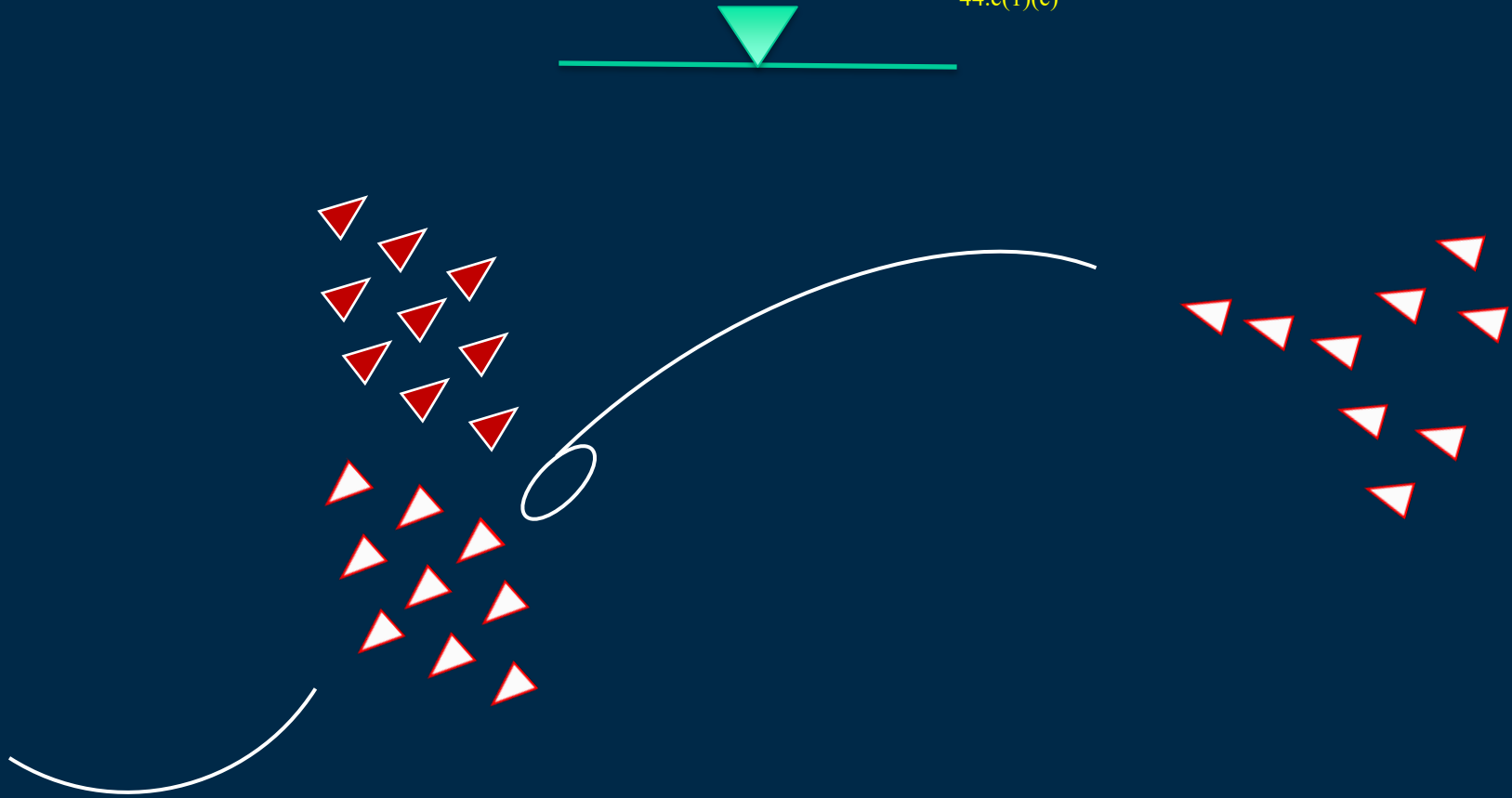
This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for aerobatic manoeuvres which direct an energy vector toward the primary spectator area at any point. BGA 100 Ch 14 Para 44.c(1)(c)



**Inverted Wedge Bottom Side, Left Turn,
Change Condor**

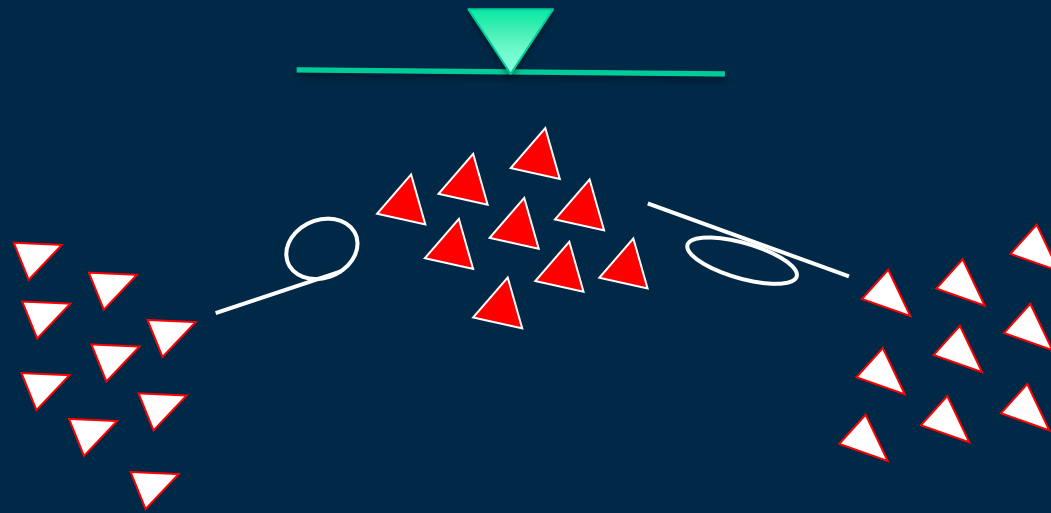
From Stage Left, the Team conducts the Condor bottom side. Continuing out liveside stage right, the team pulls up into a loop, where a change to Big Diamond is made before an UDR.

This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for aerobatic manoeuvres which direct an energy vector toward the primary spectator area at any point. BGA 100 Ch 14 Para 44.c(1)(c)



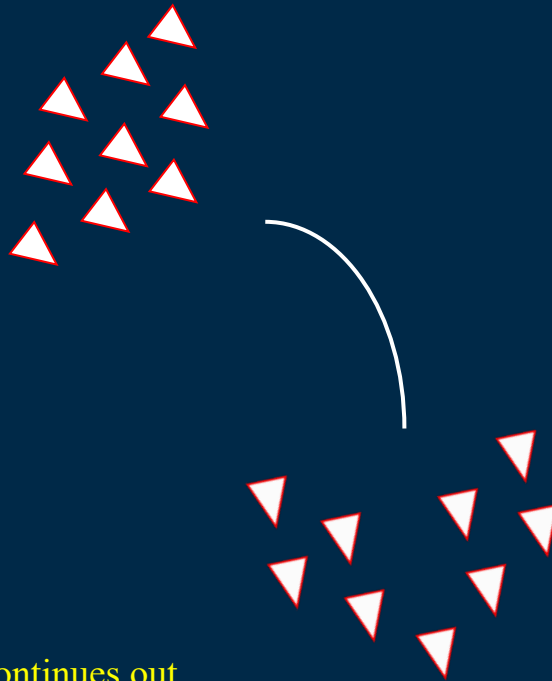
Condor Bottom Side, Condor Δ Big Diamond Loop

This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for aerobatic manoeuvres which direct an energy vector toward the primary spectator area at any point. BGA 100 Ch 14 Para 44.c(1)(c)



From Stage right the Snowbirds perform the Big Diamond Combo. The maneuver starts with a roll and ends with a loop, before the team continues out liveside changing to Palm.

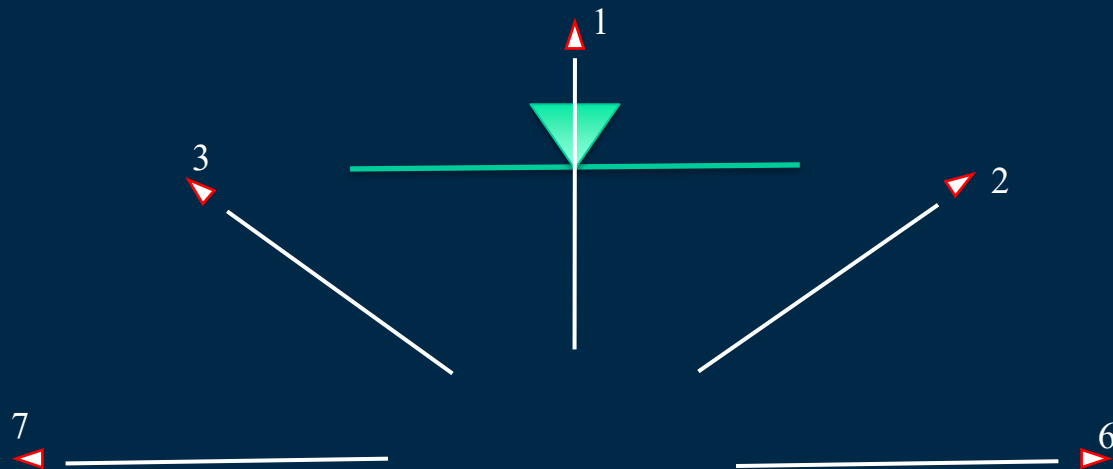
Big Diamond Combo (Roll & Loop)



Following the Big Diamond Combo, the Team continues out
liveside, changing to Palm, to prepare for the Centennial
Split.

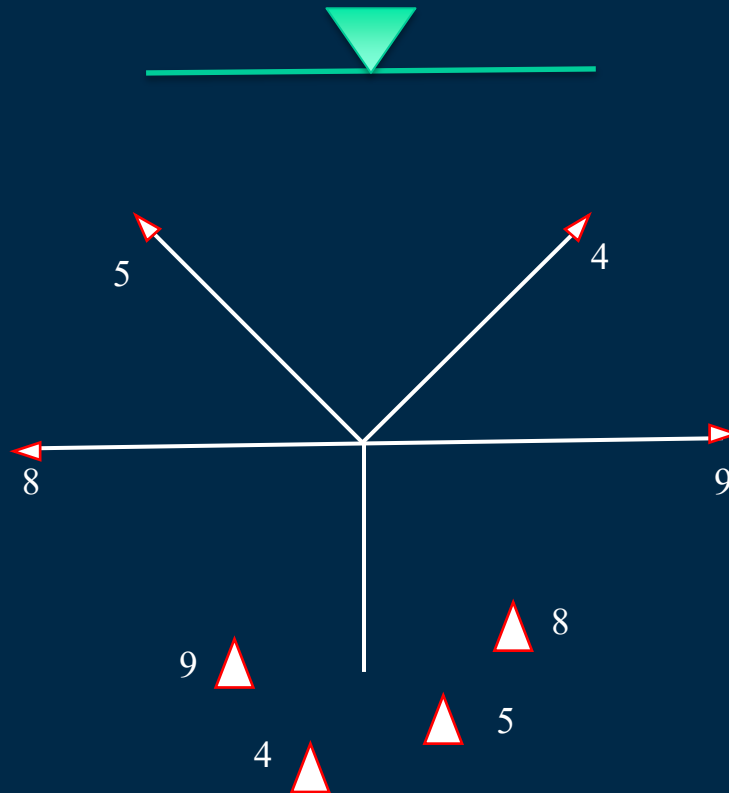
Big Diamond Change Centennial

From Liveside, the Team Splits, Snowbirds 1-7 rejoin deadside. The Solos split to the line.

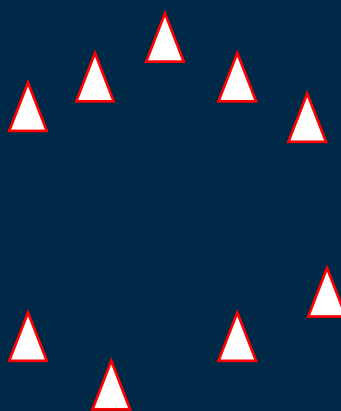
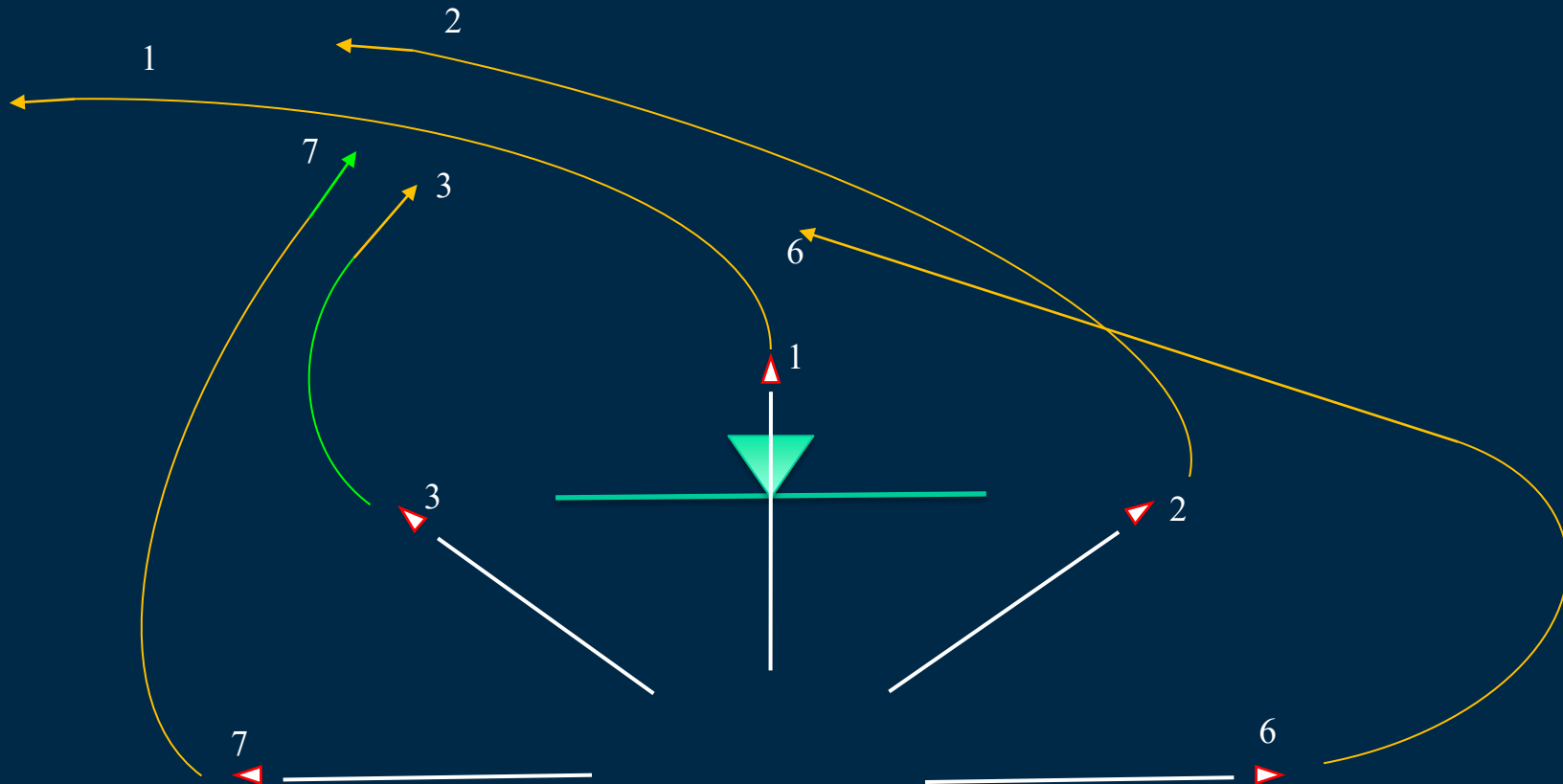


Centennial Split

Following the split of the front Vic, Snowbird 8 calls for the split of Snowbirds 4, 5, 8 and 9. An inward burst is initiated, with Stems climbing 45 degrees and the Solos split to the line.

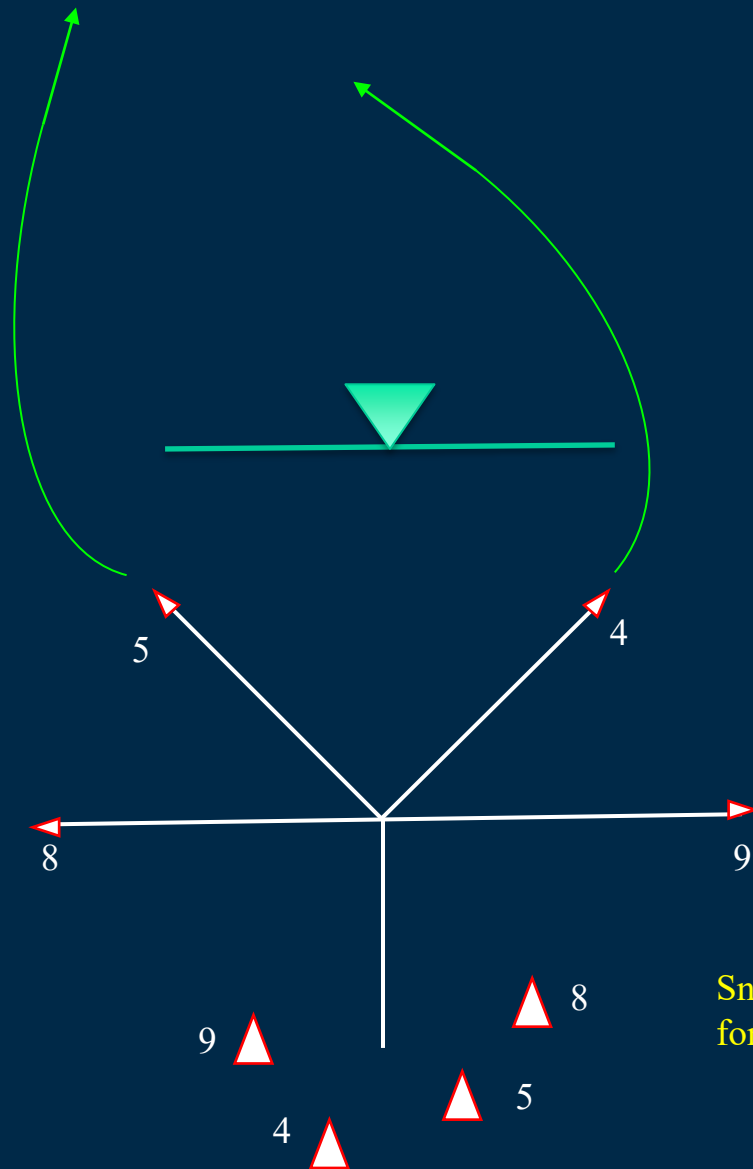


Centennial Split



Rejoin

Post Smoke off, all players climb above 1000 feet AGL before transitioning deadside. Snowbirds 1-7 rejoin deadside. Rejoin order 1-3-7-2-6-5-4.



Snowbird 5 and 4 rejoin with the main formation deadside. Solos take the line.

Rejoin Continued

SOLO SERIES 1

—|||— = Descent

—⏏— = Climb

↺
○ = Roll



Following the Centennial Split to the line, Solos 8 & 9 fly a Cuban reversal, conduct a Knife Edge cross, fly another Cuban reversal, conduct a Level Roll cross, and then exit deadside at 1000' AGL with a Pigtail.

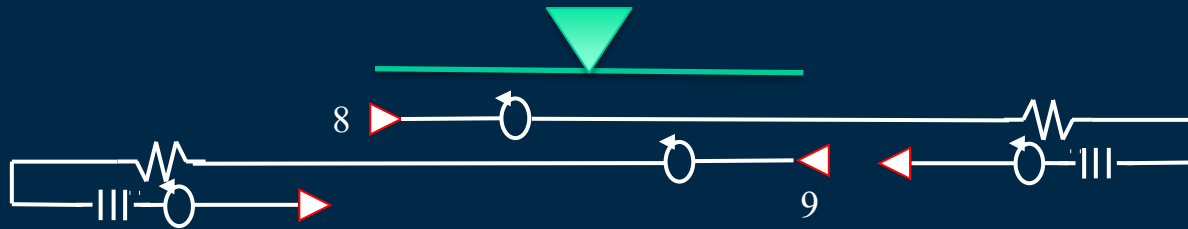
S1. Cuban...

SOLO SERIES 1

—|||— = Descent

—⌒— = Climb

⤵
○ = Roll



Following the Centennial Split to the line, Solos 8 & 9 fly a Cuban reversal, conduct a Knife Edge cross, fly another Cuban reversal, conduct a Level Roll cross, and then exit deadside at 1000' AGL with a Pigtail.

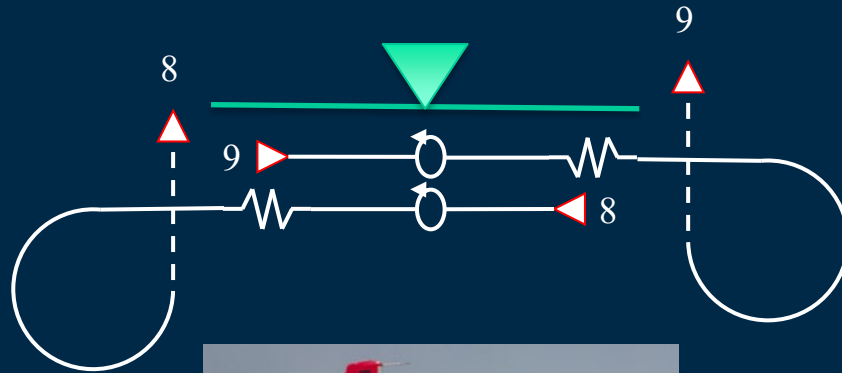
S2. ... Knife Edge, Cuban...

SOLO SERIES 1

—|||— = Descent

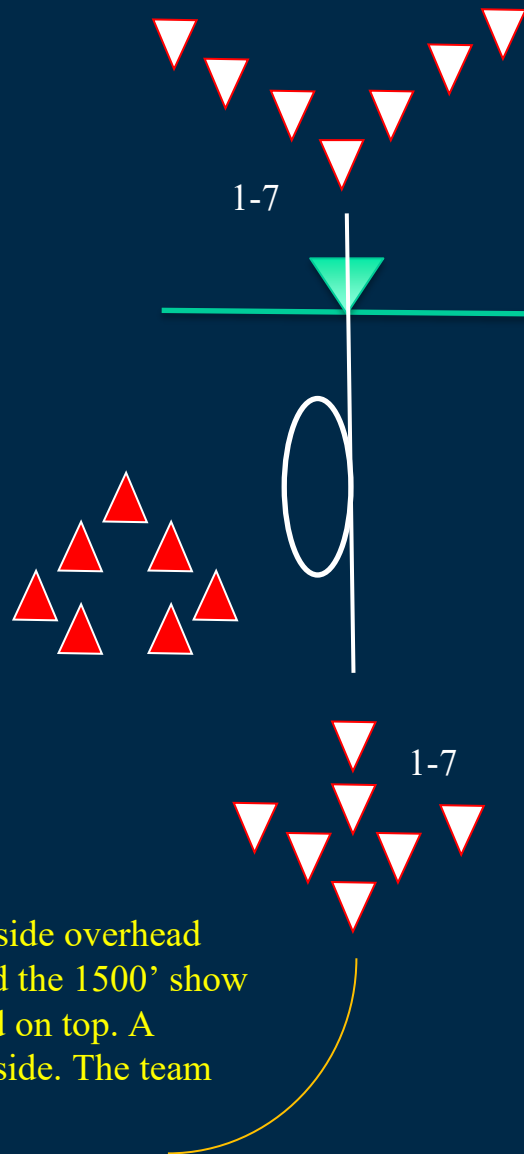
—∩— = Climb

↺ = Roll



Following the Centennial Split to the line, Solos 8 & 9 fly a Cuban reversal, conduct a Knife Edge cross, fly another Cuban reversal, conduct a Level Roll cross, and then exit deadside at 1000' AGL with a Pigtail.

S1. ... Level Roll, Pigtail Deadside Exit



The main formation enters from deadside overhead and pulls up into a loop in Vic beyond the 1500' show line. A change to Wedge is completed on top. A change to Arrow is made on the backside. The team then continues UDR.

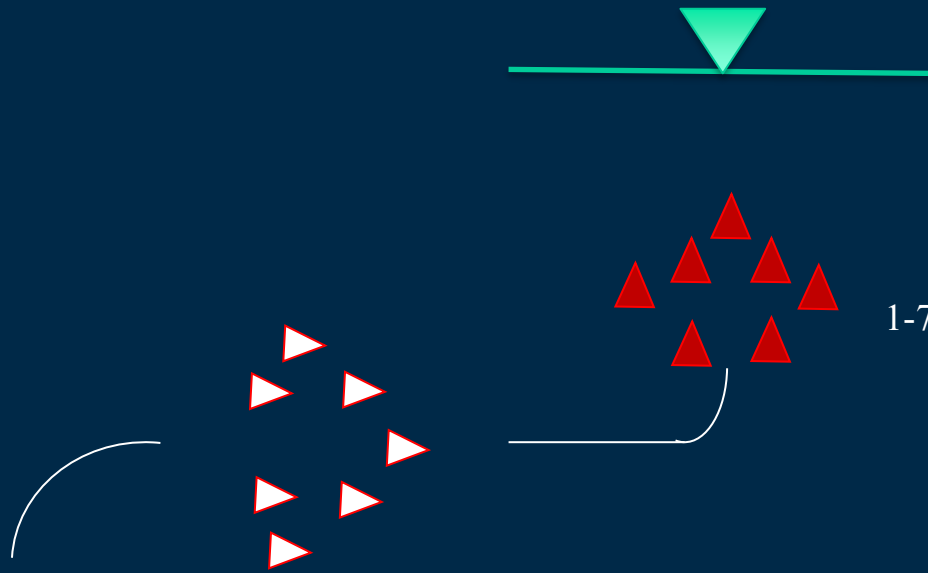


This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for over-flight of the primary spectator area at 500 feet. BGA 100 Ch 14 Para 44.b(3)(e)

Vic Δ Wedge Δ Arrow loop

Change to Wedge is called in the right hand repositioning turn. Parallelling the showline, Lead will initiate the Wedge Clover Downward Split, calling for the Split on the backside.

This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for aerobatic manoeuvres which direct an energy vector toward the primary spectator area at any point. BGA 100 Ch 14 Para 44.c(1)(c)



Wedge Clover Downward

The Outers will split to parallel to show line

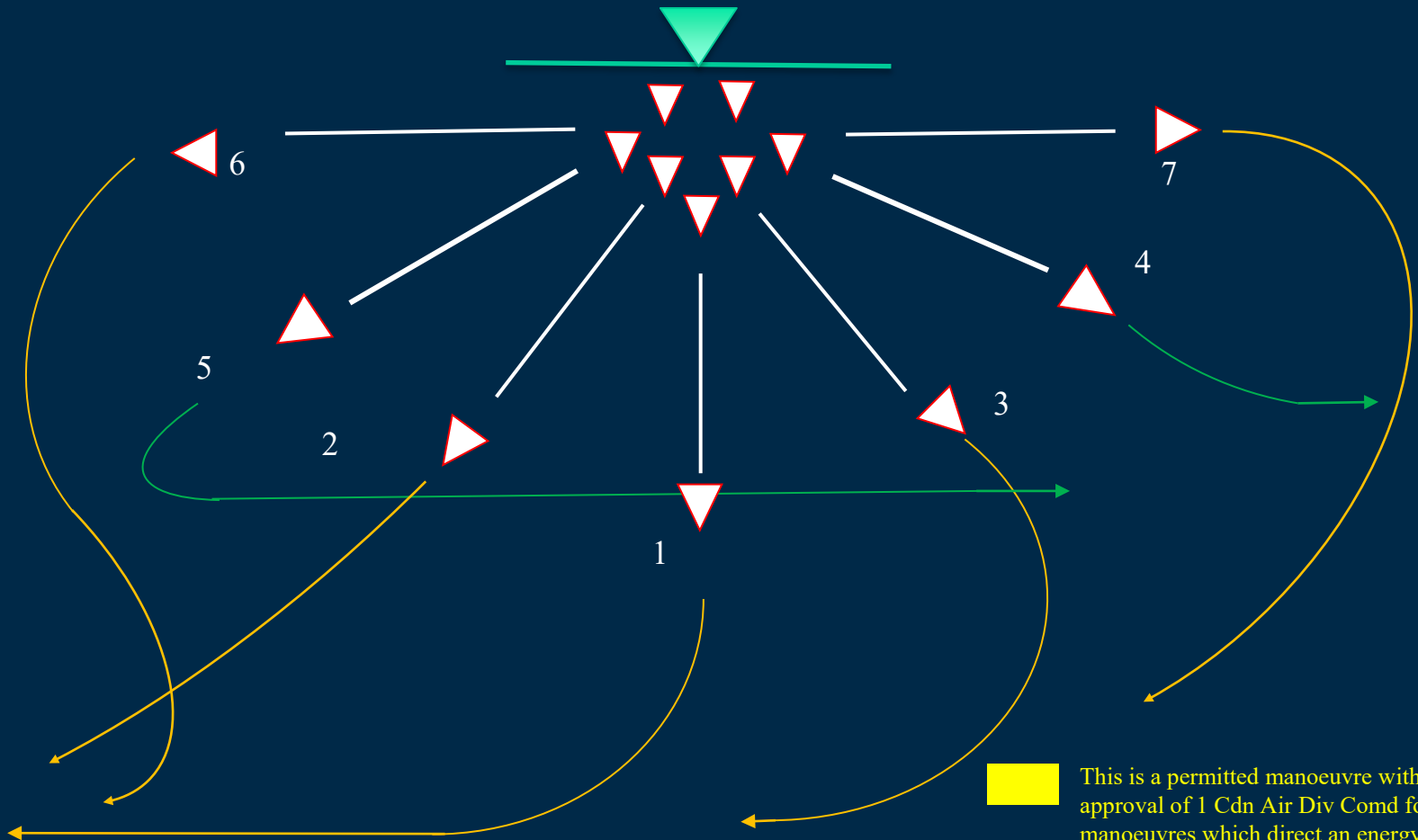
The Stems and Inners will split 30 degrees offset

All players will level off at 500' heading Liveside

Stems will maintain at 500' post split to rejoin stage left with the Solos for the Heart

Outers will automatically climb at the smoke off call to above 1000' to make the miss on the Stems.

1,2,3,6 & 7 will rejoin Liveside stage right for the LA Combo



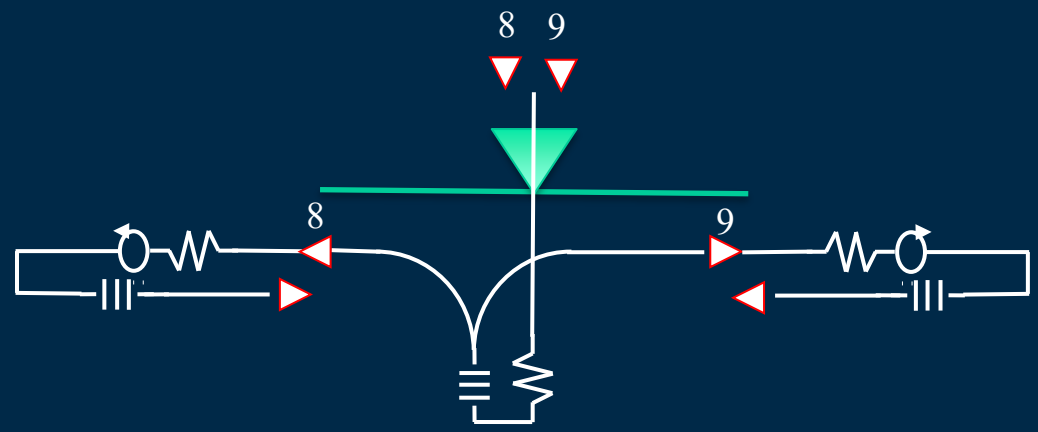
This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for aerobatic manoeuvres which direct an energy vector toward the primary spectator area at any point. BGA 100 Ch 14 Para 44.c(1)(c)

Wedge Clover Downward

This is a permitted manoeuvre with the approval of 1
Cdn Air Div Comd for over-flight of the primary
spectator area at 500 feet. BGA 100 Ch 14 Para
44.b(3)(e)

SOLO SERIES 2

—|||— = Descent
~ = Climb
↺ = Roll



Following the Wedge Clover Downward, Snowbird Solos pull up into the Noose, split on the downline, pull up into a Vertical reversal, and conduct the Flip Flop cross before exiting liveside to rejoin for the heart with Snowbirds 4 & 5

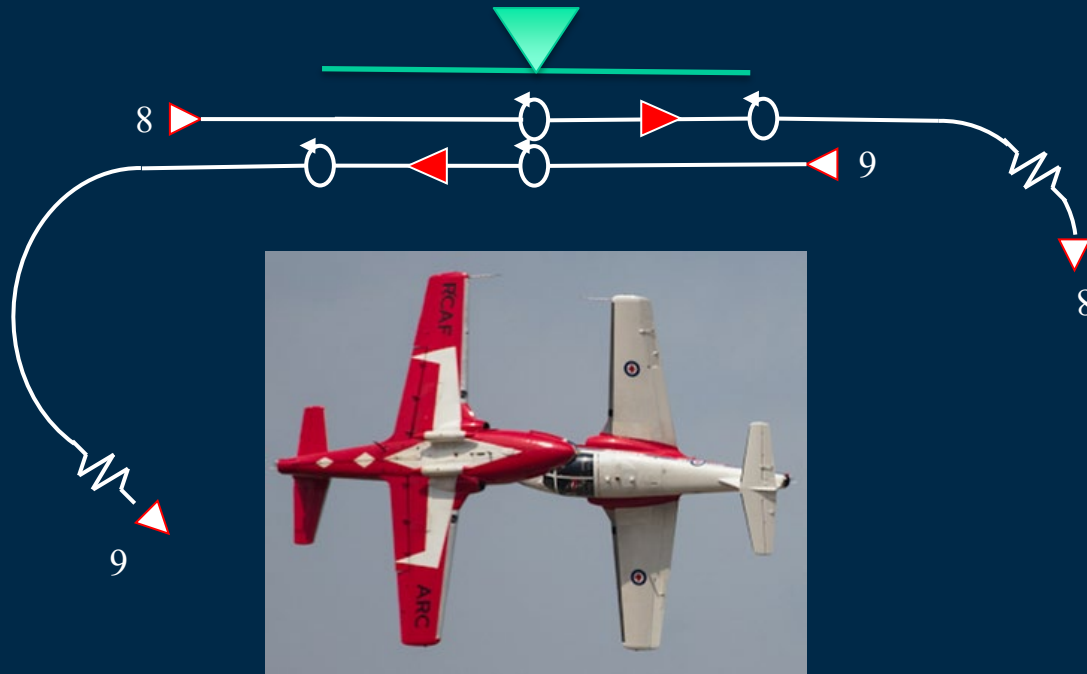
S2. Noose, Vertical...

SOLO SERIES 2

—|||— = Descent

—∩— = Climb

○ = Roll



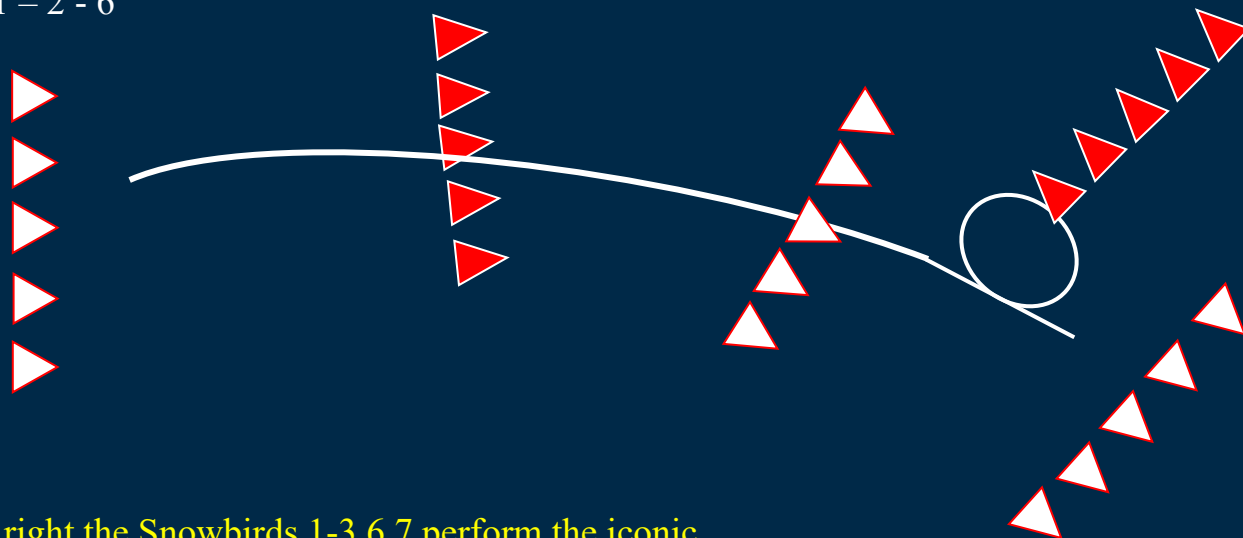
Following the Wedge Clover Downward, Snowbird Solos pull up into the Noose, split on the downline, pull up into a Vertical reversal, and conduct the Flip Flop cross before exiting liveside to rejoin for the heart with Snowbirds 4 & 5

S2. ... Flip Flop, Deadside Exit



This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for aerobatic manoeuvres which direct an energy vector toward the primary spectator area at any point. BGA 100 Ch 14 Para 44.c(1)(c)

7 - 3 - 1 - 2 - 6

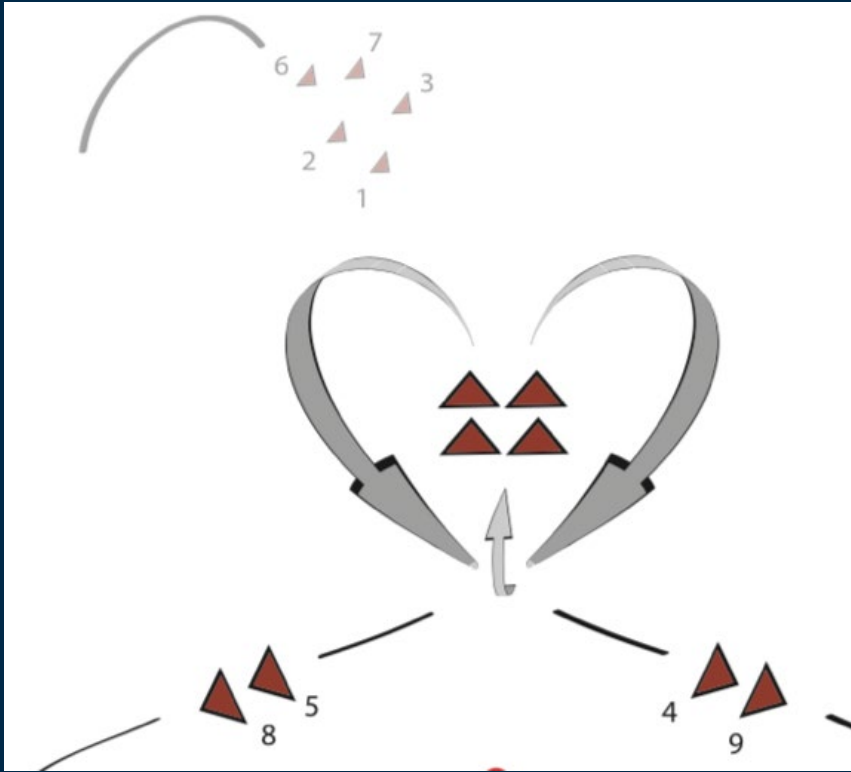


From Stage right the Snowbirds 1-3,6,7 perform the iconic Line Abreast Combo. The maneuver starts with a roll and ends with a loop while each jet are side by side.

8,5 ▲ ▲ 9,4

Line Abreast Roll and Loop

HEART

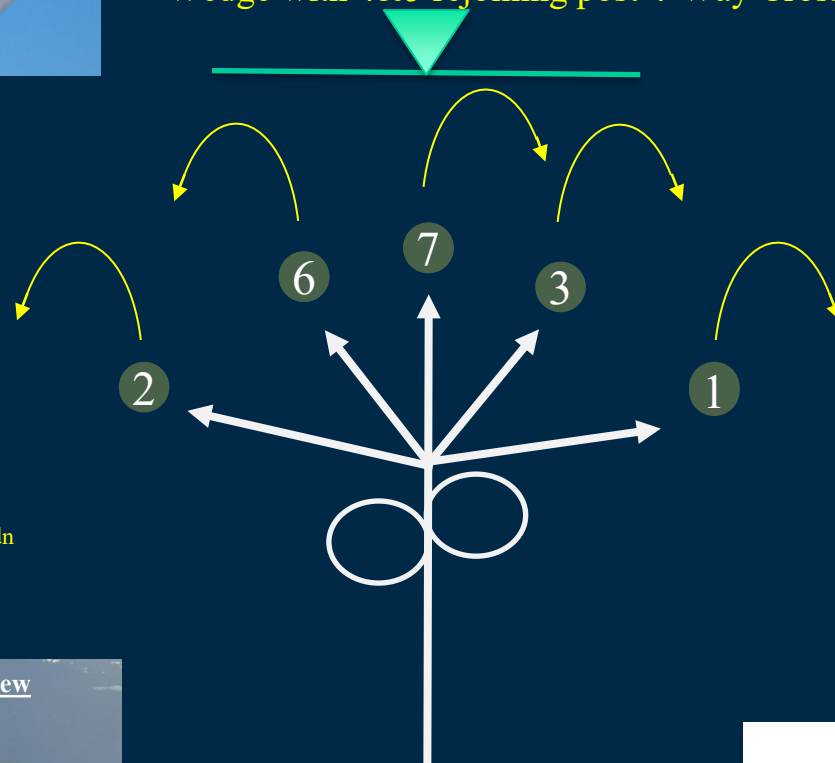


Snowbirds 8 with 5 and 9 with 4, run in from liveside and complete separate clover leafs to illustrate a heart with the smoke lines

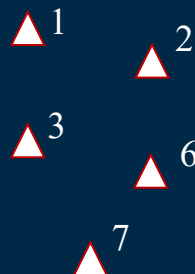
1,2,3,6,7 setup for the Lagback Cross



Snowbirds 1,2,3,6,7 run-in from live-side. Prior to entering the show box, Snowbird 7 executes 2 barrel rolls around the formation's flight path (if no extension, Snowbird 7 flies straight an level). An inward burst is subsequently executed prior to the 1500' show line. Lagback players exit liveside to rejoin Wedge with 4&5 rejoining post 4-Way Cross.

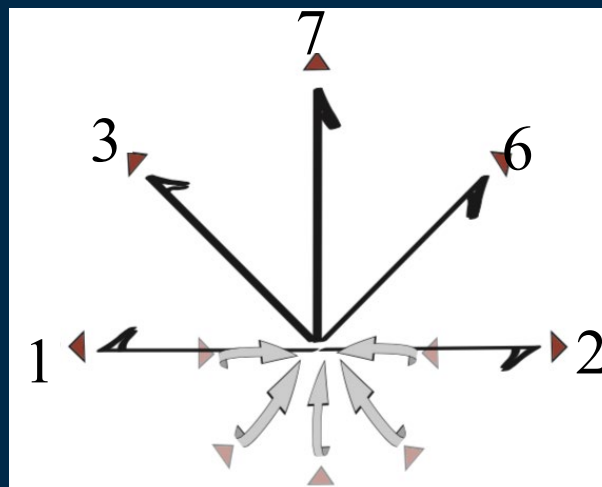


This is a permitted manoeuvre with the approval 1 Cdn Air Div Comd for aerobatic manoeuvre outside the sterile air display area below 1500 feet. BGA 100 Ch 14 Para 44.c(1)(a)

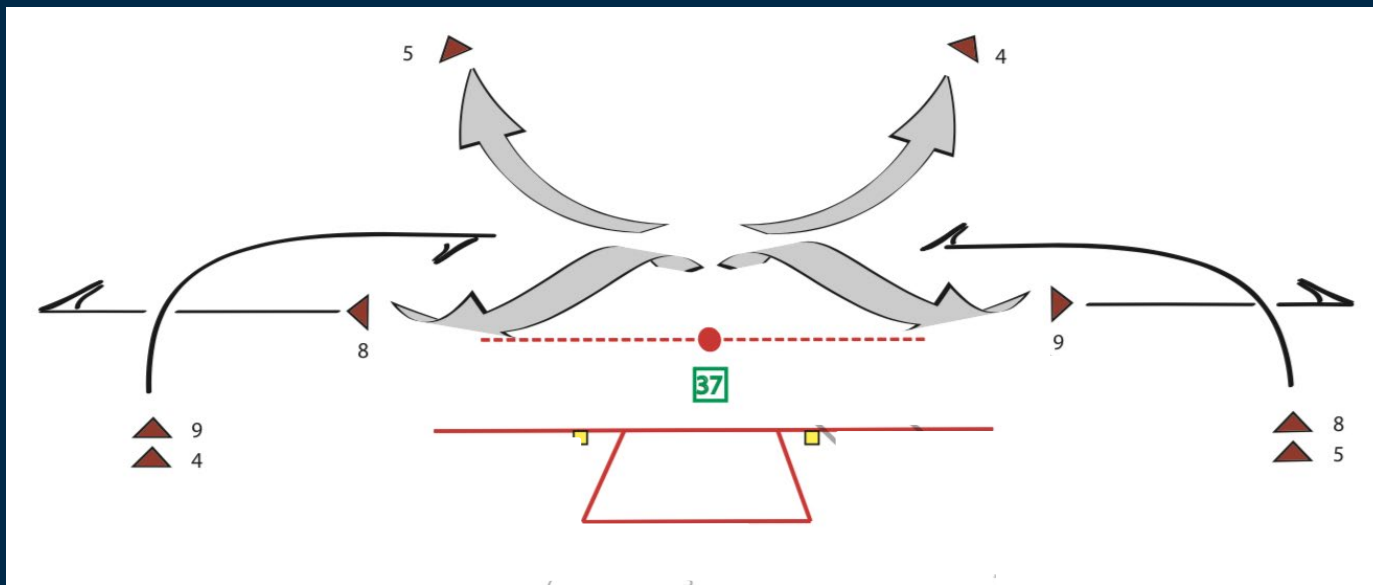


Lagback Cross

Head-On View



SOLO SERIES 3



Snowbirds 9/4 and 8/5 enter from stage left and right respectively and run-in along the show line to execute the 4-Way Cross whereupon Snowbird 4 & 5 exit deadside to rejoin with Snowbirds 1,2,3,6,7. Solos then fly a Cuban reversal and conduct a Cobra Cross to exit deadside

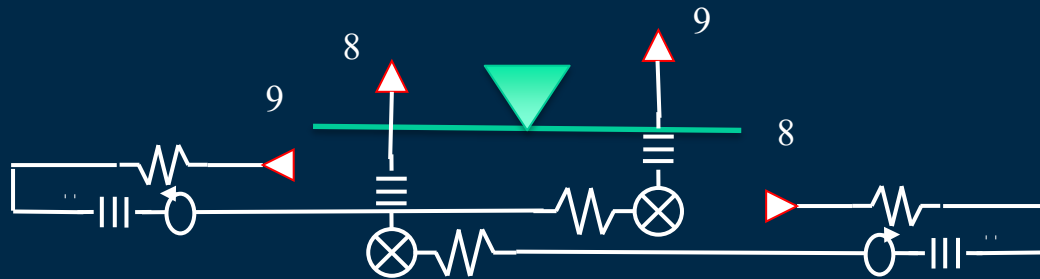
S5. 4-Way...

SOLO SERIES 3

—|||— = Descent

—∩— = Climb

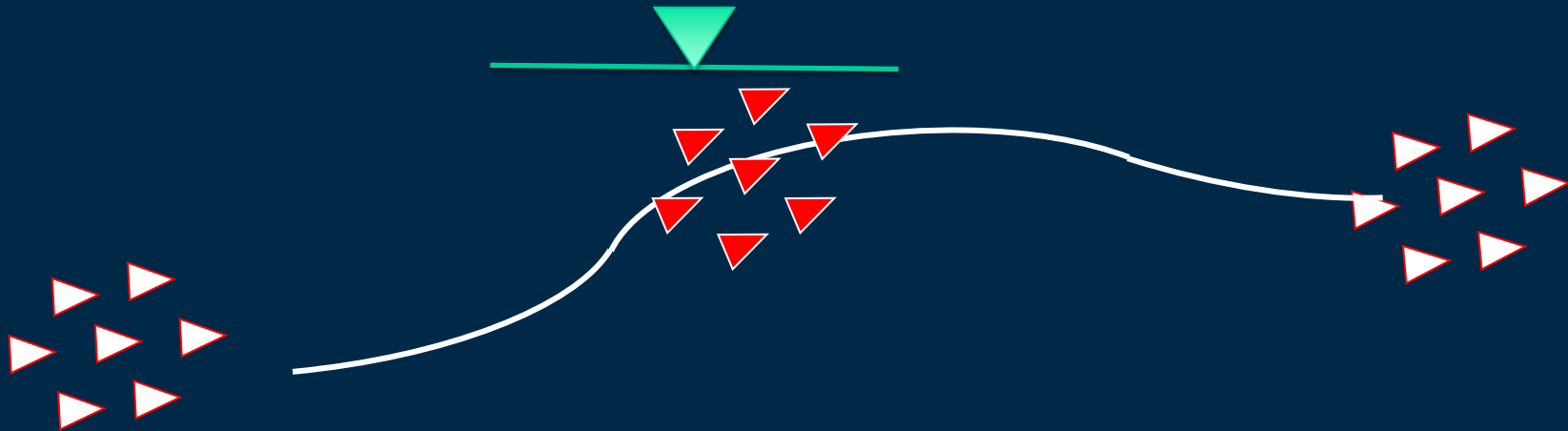
↺ = Roll



Snowbirds 9/4 and 8/5 enter from stage left and right respectively and run-in along the show line to execute the 4-Way Cross whereupon Snowbird 4 & 5 exit deadside to rejoin with Snowbirds 1,2,3,6,7. Solos then fly a Cuban reversal and conduct a Cobra Cross to exit deadside

S5. ... Cuban, Cobra Exit Deadside

This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for aerobatic manoeuvres which direct an energy vector toward the primary spectator area at any point.
BGA 100 Ch 14 Para 44.c(1)(c)



From Stage right 1-7 perform a roll in Double Diamond, exiting Stage Left.

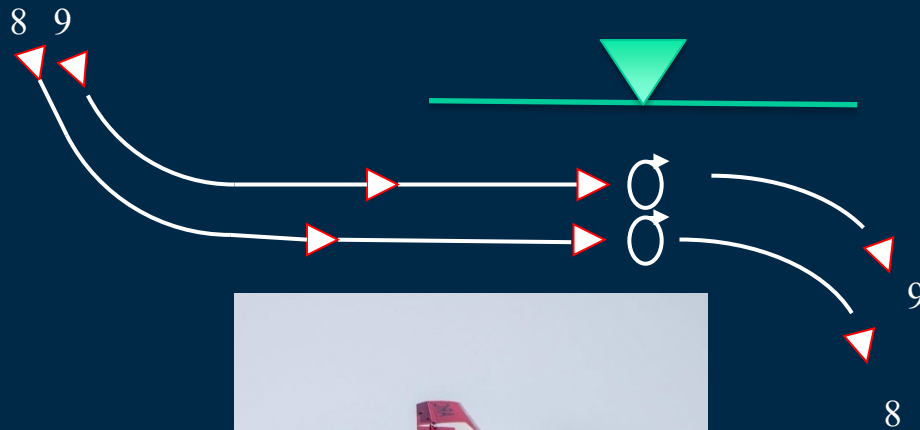
Double Diamond Roll

SOLO SERIES 4

—|||— = Descent

—∩— = Climb

↺ = Roll



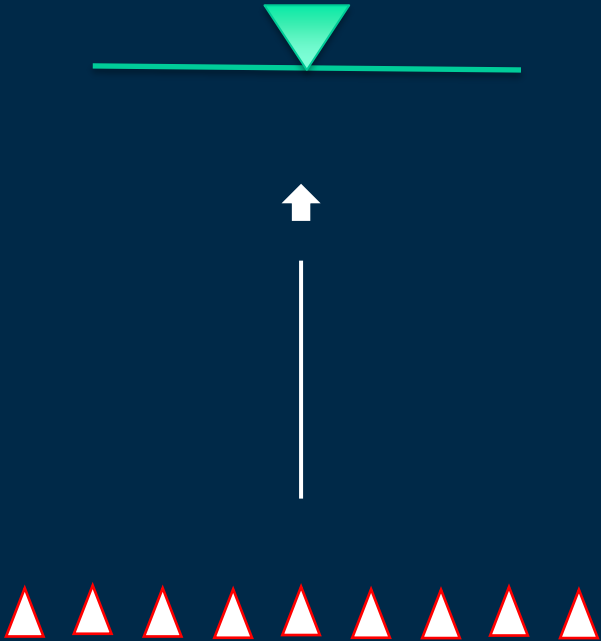
Solos will follow the Double Diamond Roll with the Yogi Roll. They approach from stage right with 8 hiding behind 9. Upon passing show center, both solos simultaneously roll left for a $\frac{3}{4}$ roll that will have them exit liveside to rejoin the main formation.

S5. Yogi Roll, Exit Liveside to Rejoin

Following the Solo rejoin, the Team changes into Big Vic, and thereafter 9 Plane Line Abreast. From Liveside, the team flies directly over stage centre, before continuing deadside.



This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for over-flight of the primary spectator area at 500 feet. BGA 100 Ch 14 Para 44.b(3)(e)



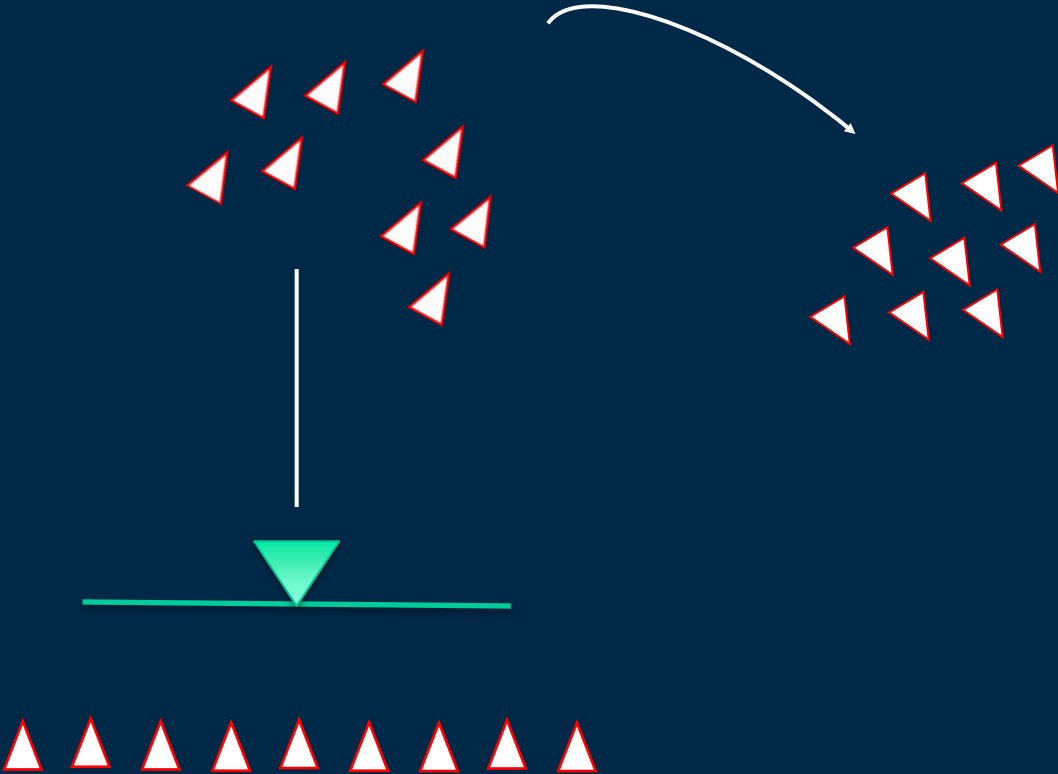
9 Plane Line Abreast



Once Deadside, the team changes to Palm, and thereafter Big Diamond, to set up for the Big Diamond Topside.

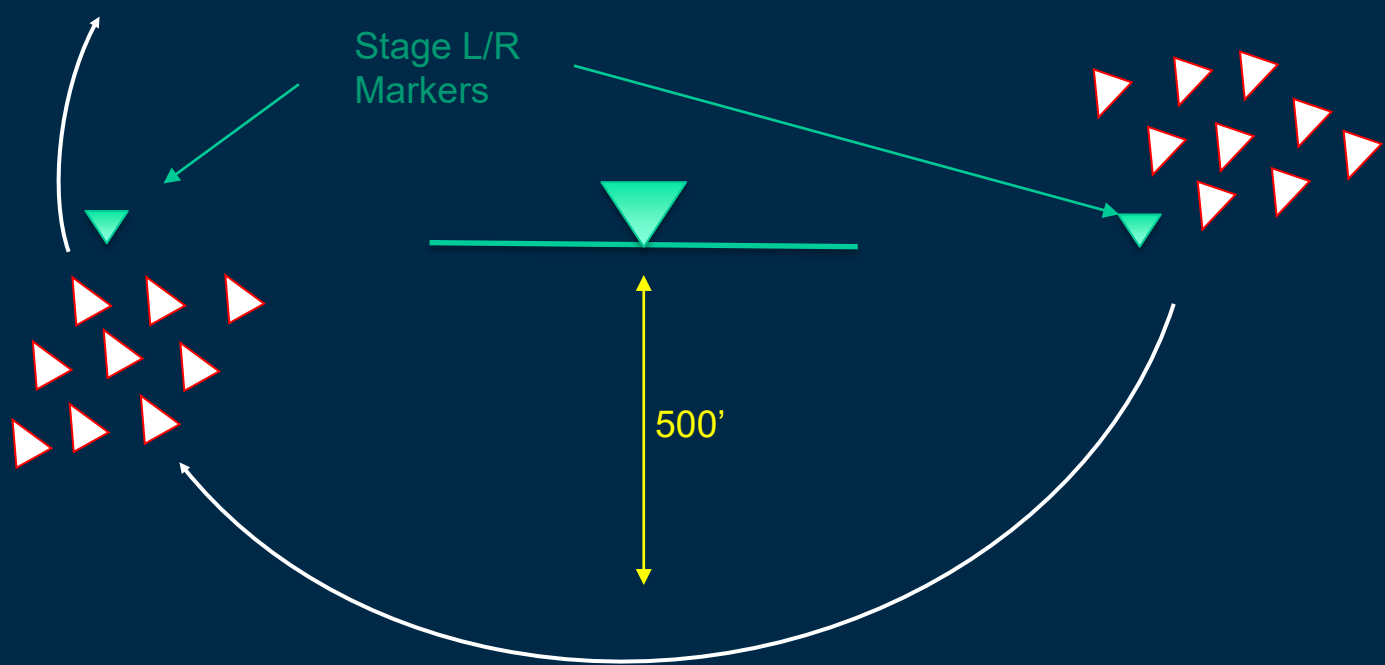


This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for over-flight of the primary spectator area at 500 feet. BGA 100 Ch 14 Para 44.b(3)(e)



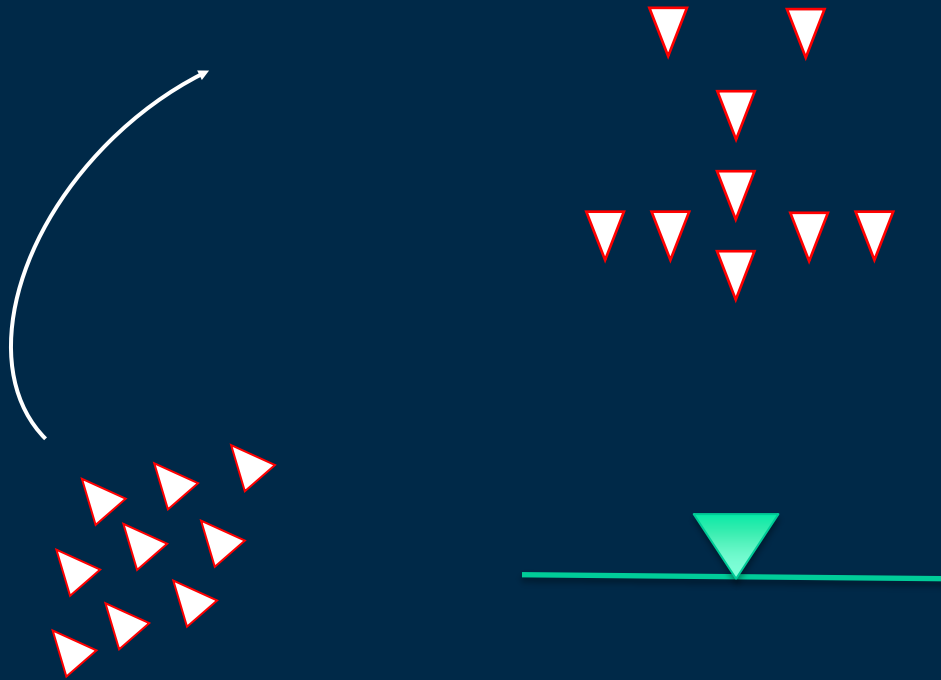
9 Plane Line Abreast





From deadside stage left, the formation flies past for the Big Diamond topside (respecting the stage left and right corner markers and minimum 500' from Primary Spectator Area,) before continuing deadside.

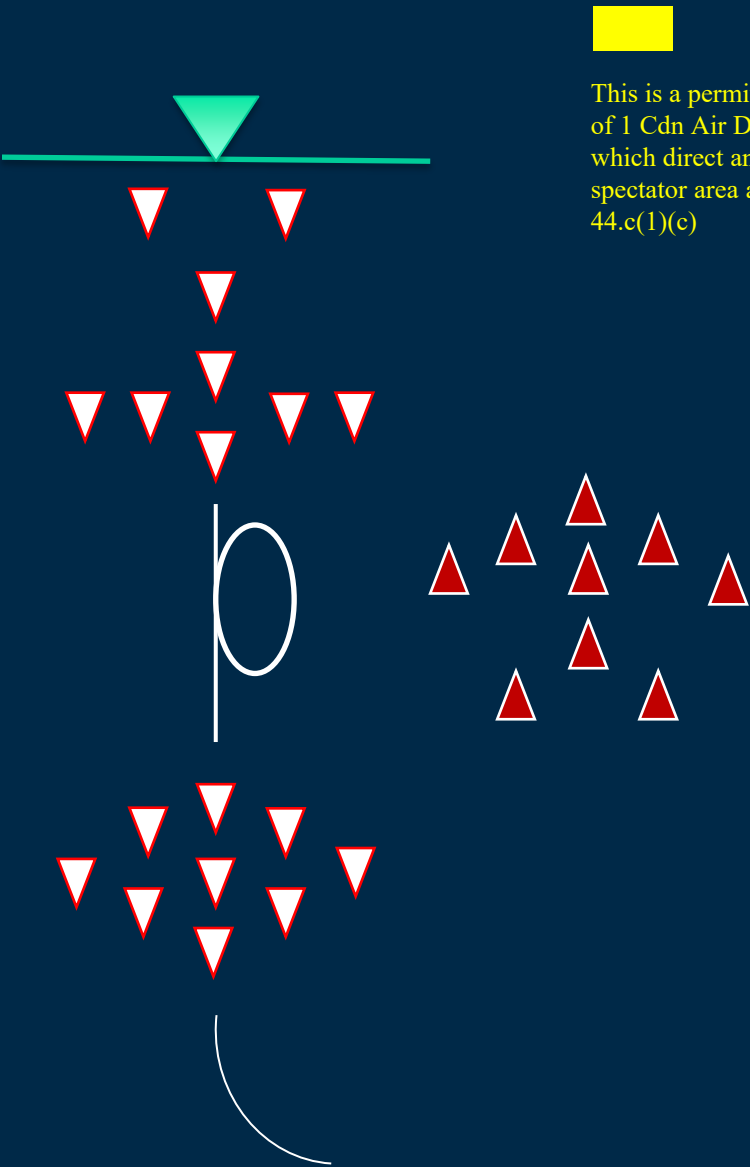
Big Diamond Topside



While deadside, the formation changes to Big Arrow, and thereafter Inukshuk.

Big Diamond Δ Inukshuk

Running in from deadside, the Snowbirds pull up in the Inukshuk Loop, on the frontsides, a change is made to Big Arrow, followed by Big Diamond on the backside. The team then turns left before reversing right to set up for the Canada Burst.



This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for aerobatic manoeuvres which direct an energy vector toward the primary spectator area at any point. BGA 100 Ch 14 Para 44.c(1)(c)

Inukshuk Δ Big Diamond Loop



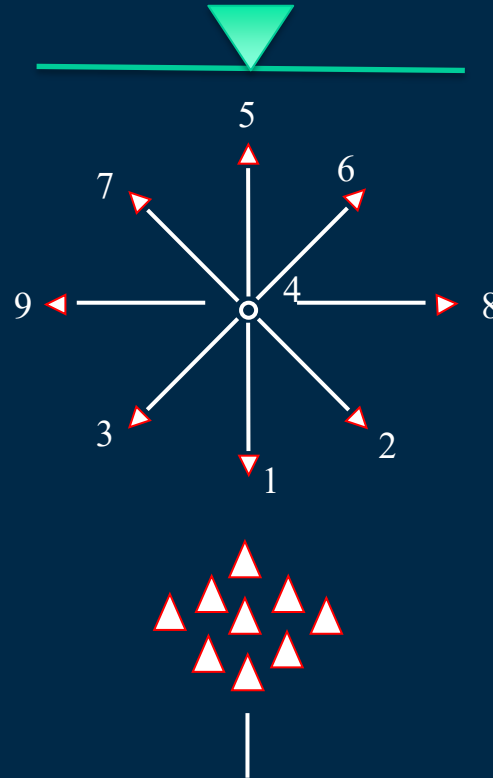
"Snowbirds Split Now"

Split – 5, 8, 9

Now – 6, 7

Pause – 2, 3, 4

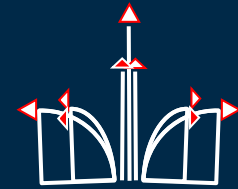
"Smoke off - Now"



Continuing from liveside, the Snowbirds pull up like a loop and burst at the vertical. Lines are as depicted.

9-Ship Canada Burst

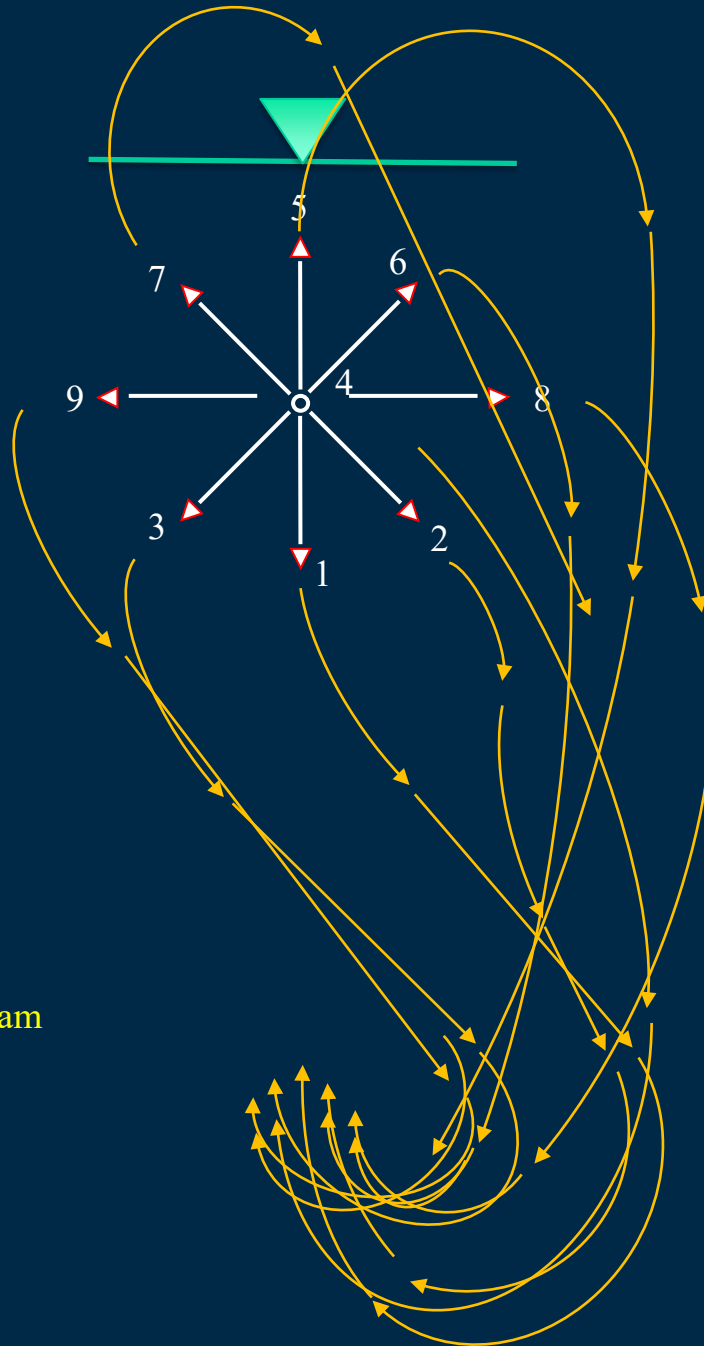
Head-On View



This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for non aerobatic manoeuvre by multiple aircraft in formation with an energy vector toward the primary spectator area. BGA 100 Ch 14 Para 44.c(1)(c)



Canada Burst Rejoin



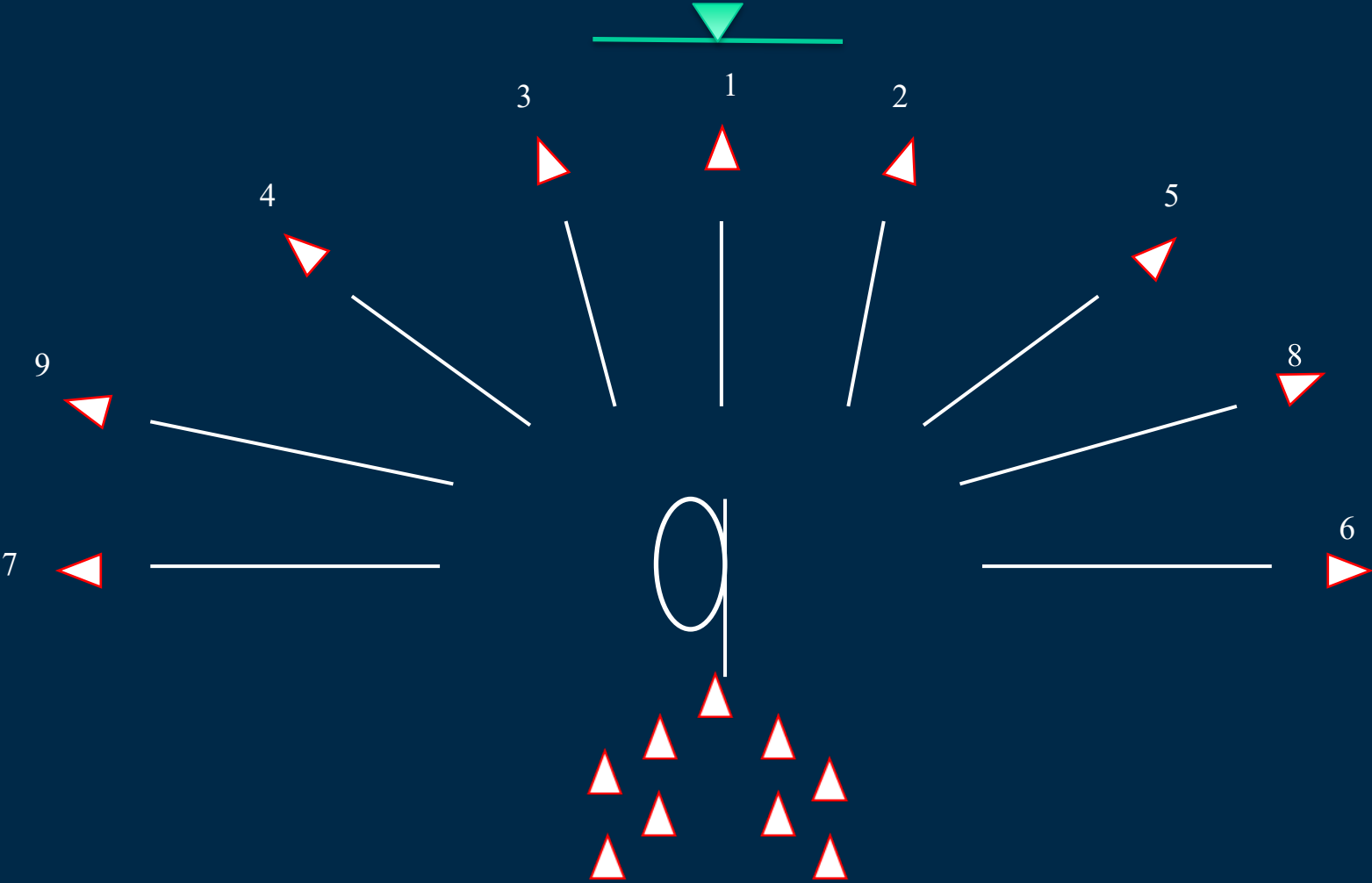
Following the Canada Burst, the team
rejoins to Palm.
Rejoin Order: 1-2-3-8-4-9-6-5-7

Encore

Pending show site, transit fuel and WX considerations,
After the Canada Burst, Snowbird 1 will finish the show
with BD TOP, BoB or Palm Downward to Land.

The main formation enters from liveside and pulls up into a Palm Loop. On the backside, a split is initiated, and the team will level off at 500', before turning either left or right to land.

This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for non aerobatic manoeuvre by multiple aircraft in formation with an energy vector toward the primary spectator area. BGA 100 Ch 14 Para 44.c(1)(c)



Palm Downward to Land



431 (AD) SQN 2024 Low Show

1. The following is a pictorial description of the proposed 2024 Low Show
2. Maneuvers have been classified as follows:

-  – Permitted Maneuvers as per BGA 100 Ch 14
-  – Permitted Maneuvers requiring Comd approval as per BGA 100 Ch 14

Approval

Canadian Air Division Approval is granted following a successful private acceptance show demonstration at the end of Snowbirds annual spring training. FAA NAES, or designate, will be invited to attend the acceptance show to review demonstration for pending approval or attend first practice in the USA.



Airspace Requirements

Canada

10 nm

Surface to 7,500' AGL

*May be reduced at discretion of Snowbird 1

United States

7nm

Surface to 7,500' AGL

*May be reduced at discretion of Snowbird 1

The ground tracks depicted herein represent the general flow of the main formation, solos, and specialties formations as applicable.

Modification of these ground tracks remains at the discretion of Snowbird 1, while retaining the general flow.

Snowbird 1 maintains the ability to omit any sequences laid out in this manoeuvres package in order to meet the desired conclusion for any show.



Minimum Weather:

High Show	5000 feet ceiling and 5 statute miles visibility
Low show	1500 feet ceiling and 5 statute miles visibility
Flat Show	1000 feet and 5 statute miles visibility

The BGA-100 requires a minimum visibility of three statute miles for air displays. The Snowbirds have raised the minimum visibility of the high and low show displays as an added safety measure due to the complexity of the rejoins post splits.

* A hybrid 'Low Show with High Reversals' may be flown with a minimum ceiling of 3000' AGL (solos fly Cuban reversals and SB1 leads the Double Diamond Roll)

Sterile Air Display Area

- essential personnel only within SADA during airshows
- buildings within SADA must be vacant
- event organizer must ensure SADA is clear for airshows
- standard Cat 1 showline is 1500' but minimum of 1200' for specific exceptions

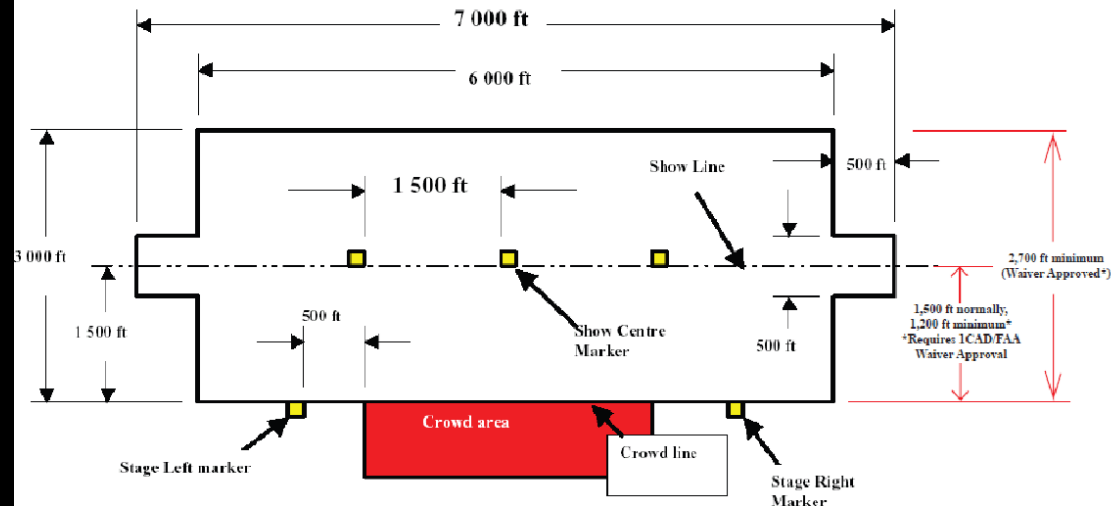
There are five markers as designated in the image below:

One marker at Show Centre, situated on the Show Line at the centre of the Show Box;

Two markers on the Show Line, each approximately 1,500 ft either side of the Show Centre marker. (If it is not geographically possible to locate each one 1,500 ft from the Show Centre marker, they need to be at least equidistant);

Stage Left and Stage Right Markers a minimum of 500 ft from the left and right edges of the Crowd Line;

The barrier defining the Crowd Line must not be closer than 500 ft from the closest active runway. As our aircraft occasionally manoeuvre to the rear of the crowd, the Crowd Line shall be no longer than 5,000 ft.





Aerobic Manoeuvring

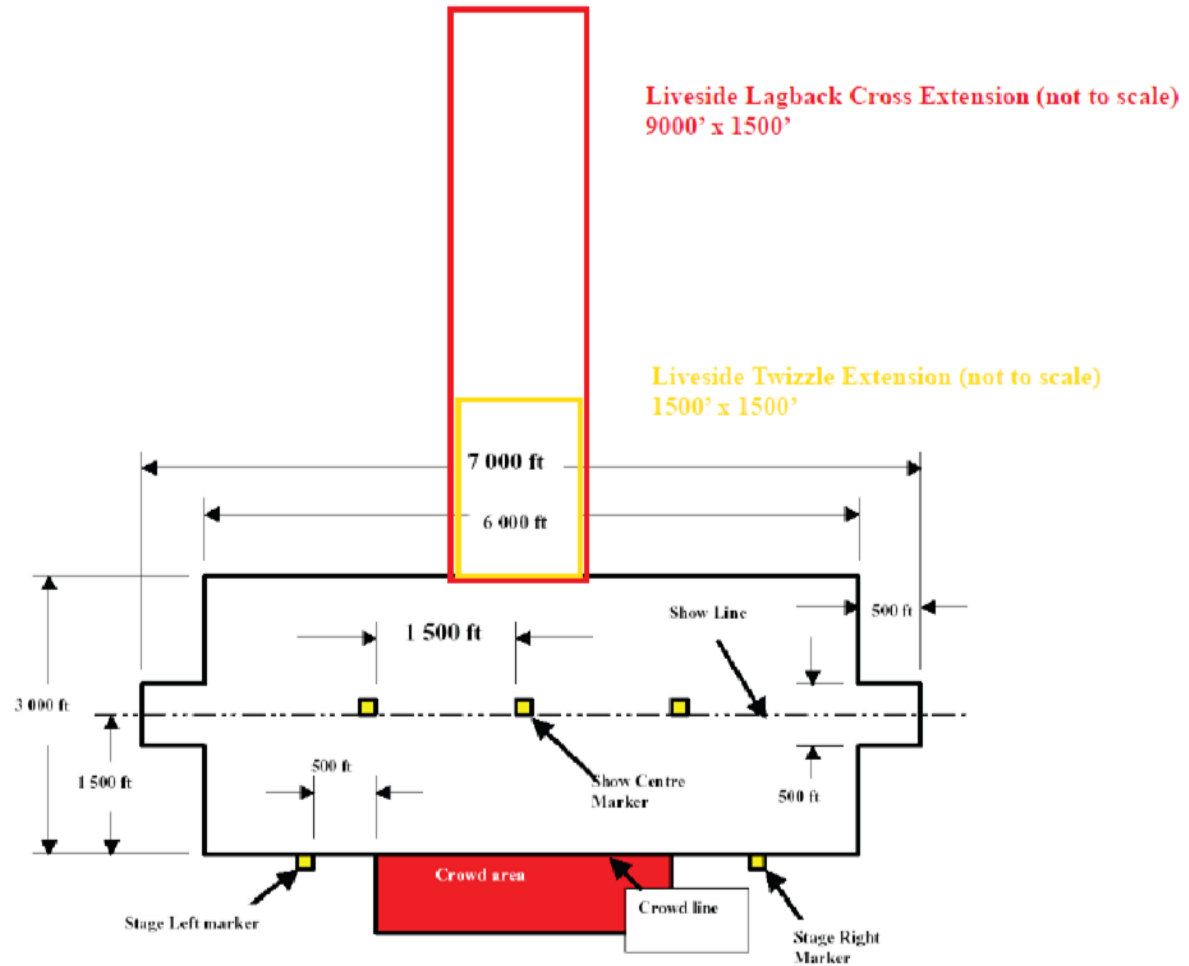
- Majority of aerobatic maneuvering occurs in SADA
- Minimum altitude 300' AGL
- Minimum airspeed 100 KIAS, Maximum airspeed 300 KIAS (+/- for density altitude adjustment)
- Certain maneuvers* outside the SADA commence 500' AGL and become aerobatic above 1500' AGL
 - Heart
 - Twizzle Roll
 - Lagback Cross

*Per B-GA-100, these maneuvers and others flown over built up areas above 1500' AGL may be permitted with Comd 1 CAD approval (acceptance show)



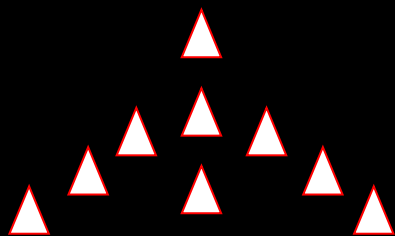
Operations in the United States

In the United States, the Canadian approved SADA will need to be modified in order to accommodate the Twizzle Roll and the Lagback Cross. While in the United States, the Battle of Britain, if flown, will be flown in such a way to remain non-aerobatic. Aircraft will not barrel roll but will instead manoeuvre fluidly remaining non-aerobatic. To accommodate the Twizzle Roll and the Lagback Cross, a liveside sterile corridor/extension, 1,500' wide and 9,000' long (as depicted below) will need to be added to the Canadian SADA. If the sterile corridor can only be 1,500' by 1,500', then the Twizzle roll can still be flown. If a liveside sterile corridor cannot be generated, the Lagback Cross and the Twizzle Roll will be modified and flown in a non-aerobatic manner. Coordination between air display organizer, local FAA Flight Standards District Offices (FSDO) and the Snowbirds will occur to determine which sterile which sterile air display area will be used and manoeuvres will be flown accordingly.

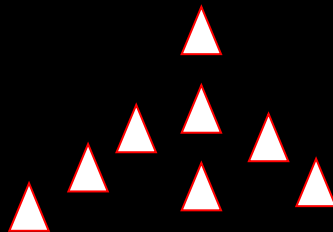


Contingency Plan

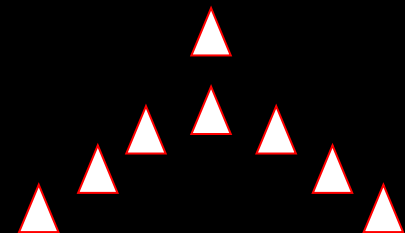
A detailed strategy for the loss of each position is pre-planned by the Snowbird Training Officer and briefed to all team members as part of Spring Training. During each show pre-brief a simulated emergency is conducted leading to a missing player scenario which is then refreshed to all teammates. In the event someone has to land before the end of the show, the specific missing player plan encountered is verbally briefed on the team common radio frequency. In all cases, Snowbird missing player philosophy is that the inside missing player's position will be filled for aesthetics, but for more demanding manoeuvres, i.e. splits or bursts, players will remain in their natural position with a "ghost" aircraft in between them and lead. A single solo show will encompass show line manoeuvring without crosses.



All Players



Missing Right Inner



Missing Line A
Stern



Ingressing/Egressing the SADA

When ingressing towards the SADA, all Snowbirds ingress altitudes shall be a minimum of 500' AGL above the highest obstacle along the aircraft track. Similarly, when egressing the SADA, all Snowbird egress altitudes shall be a minimum of 500' AGL to climbing. When there is a need to ensure safe separation between formation elements egressing the SADA and those awaiting ingress, altitude blocks are pre-briefed accordingly.

Primary Spectator Area (PSA)

Snowbird aerobatic maneuvers are flown on or beyond the Cat 1 (1500') show line

- aircraft exiting towards the crowd deadside shall maintain a minimum lateral separation of 500 ft (Stage Markers) from the left/right physical boundaries of the PSA.
- Snowbird aircraft require flight directly over the PSA when entering/exiting the Sterile Air Display Area Pending Comd Approval of these permitted manoeuvres (per BGA 100 Ch 11), all aircraft shall fly no lower than 500' AGL overhead the crowd in a wings level or level to climbing orientation.





Air Display Flight

Snowbird 1 – Major Brent Handy, *Team Lead*

Snowbird 2 – Capt Caitlin Clapp, *Inner Right Wing*

Snowbird 3 – Major Steven Timm, *Inner Left Wing*

Snowbird 4 – Capt Scott Boyd, *First Line Astern*

Snowbird 5 – Capt Thomas Thornton, *Second Line Astern*

Snowbird 6 – Capt Kyle Taylor, *Outer Right Wing*

Snowbird 7 – Capt Dominic Appolloni, *Outer Left Wing*

Snowbird 8 – Capt Marc-Andre Plante, *Lead Solo*

Snowbird 9 – Capt Patrice Powis-Clement, *Opposing Solo*

Snowbird 10 – Capt Edward Soye, *Coordinator*

Snowbird 11 – Capt Richard MacDougall, *Coordinator*



PRIMARY SPECTATOR AREA



STAGE RIGHT


1500' SHOWLINE

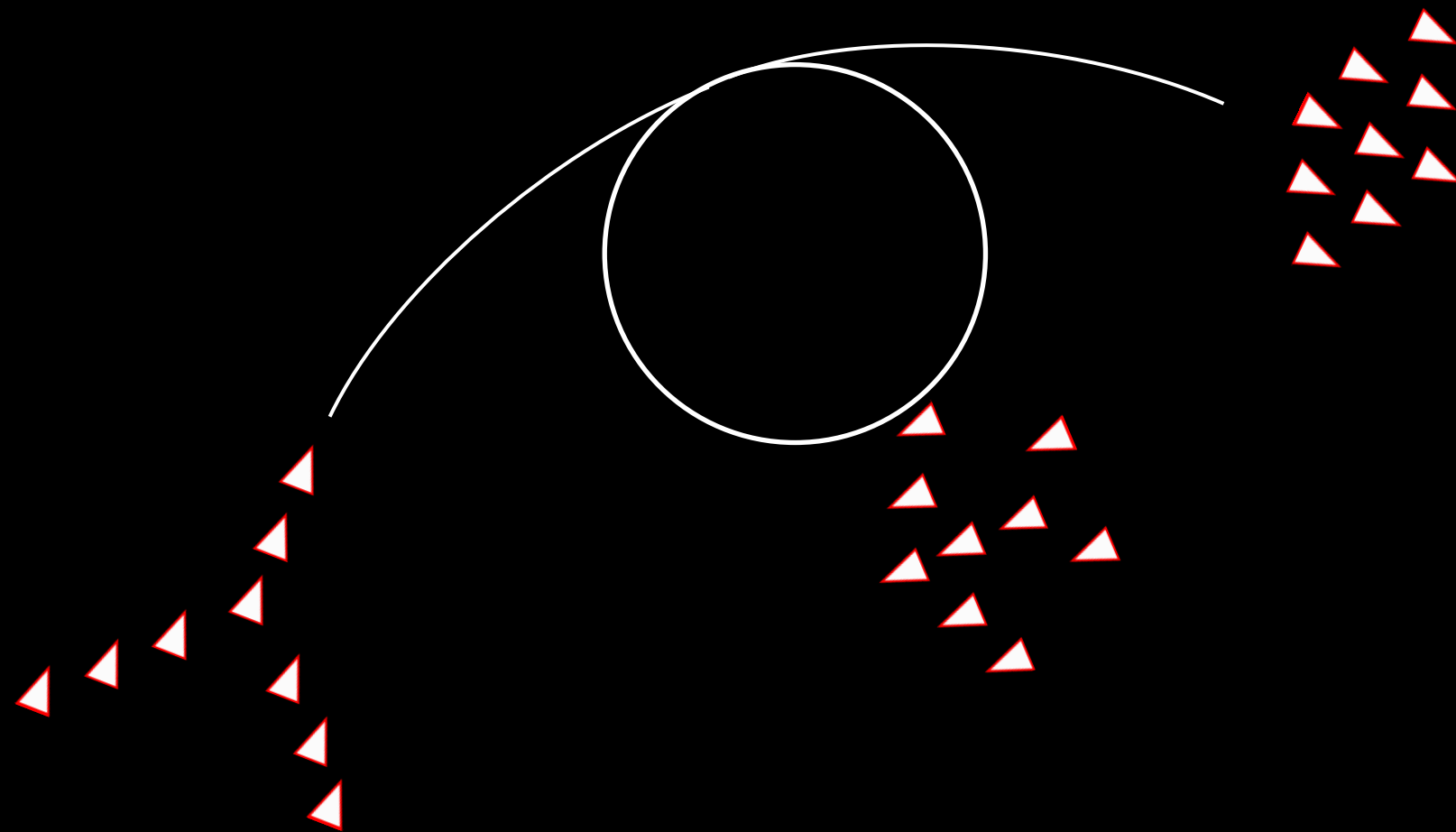
STAGE LEFT

431 (AD) SQN 2024 Low Show

Overhead pictorial with top-side and underside depictions.

Running in from liveside stage right, the Snowbirds enter a wrap in Canada Goose, before changing to Big Arrow and thereafter Big Diamond. The Team Continues out stage left, changing to Condor UDL

 This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for non aerobatic manoeuvre by multiple aircraft in formation with an energy vector toward the primary spectator area. BGA 100 Ch 14 Para 44.c(1)(c)

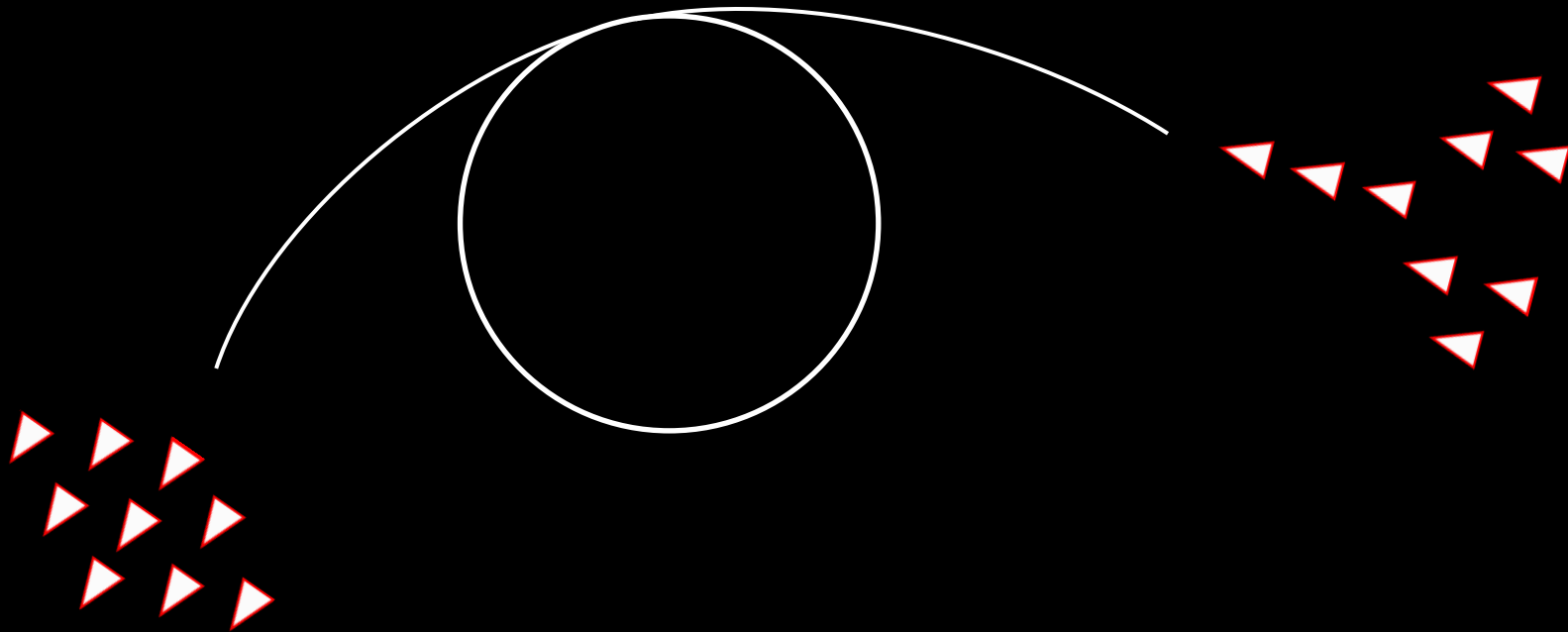


Canada Goose Δ Big Diamond Wrap UDL

Running in from stage left, the Snowbirds enter for the Condor bottom side, before entering a left-hand wrap, thereafter changing to Big Diamond. The Team continues out stage right, UDR.



This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for non aerobatic manoeuvre by multiple aircraft in formation with an energy vector toward the primary spectator area. BGA 100 Ch 14 Para 44.c(1)(c)

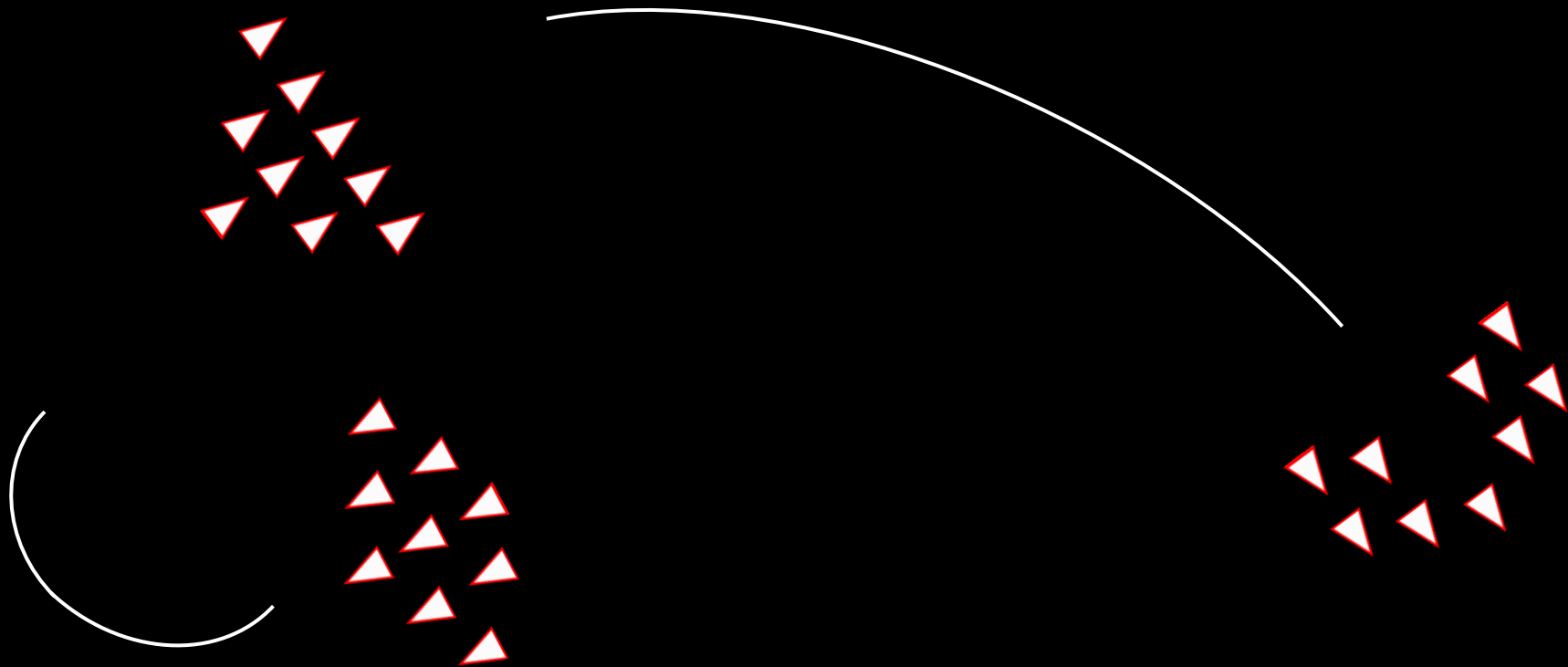


Condor Δ Big Diamond Wrap

Running in from stage right, the Snowbirds enter for the Inverted Wedge bottom side, before continuing out liveside stage left, changing to Palm, to set-up for the Centennial Split

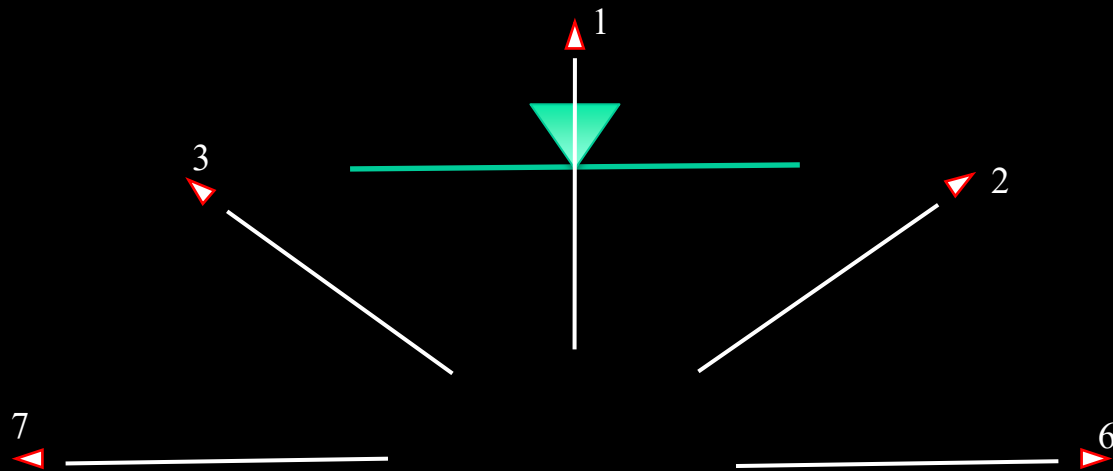


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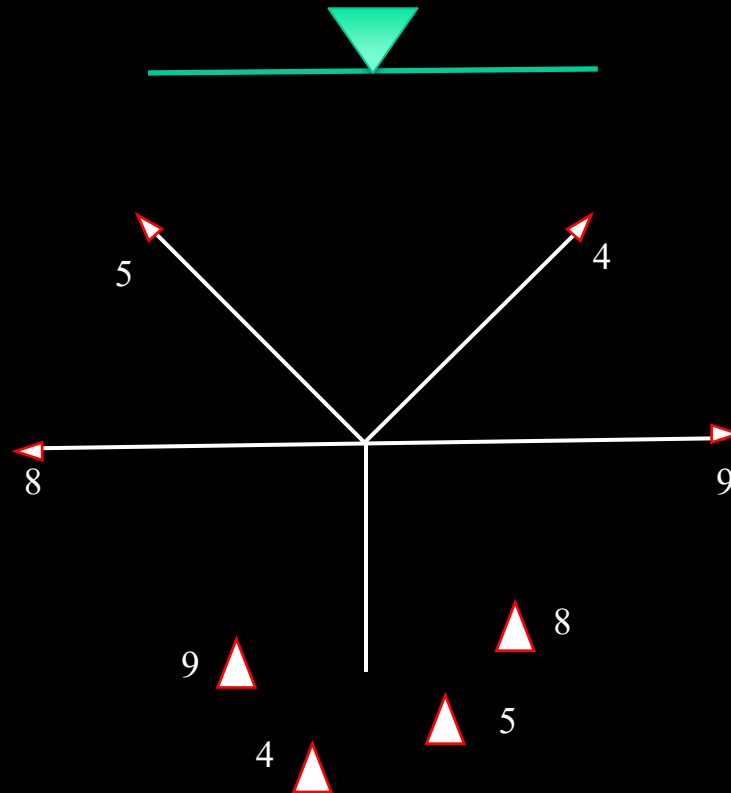
Inverted Wedge Bottom Side

From Liveside, the Team Splits, Snowbirds 1-7 rejoin deadside. The Solos split to the line.

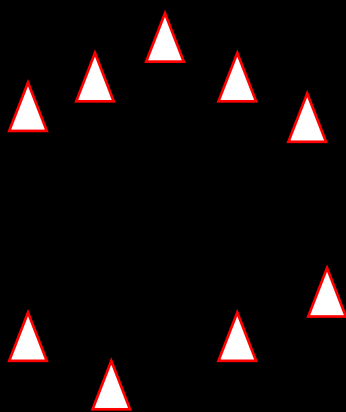
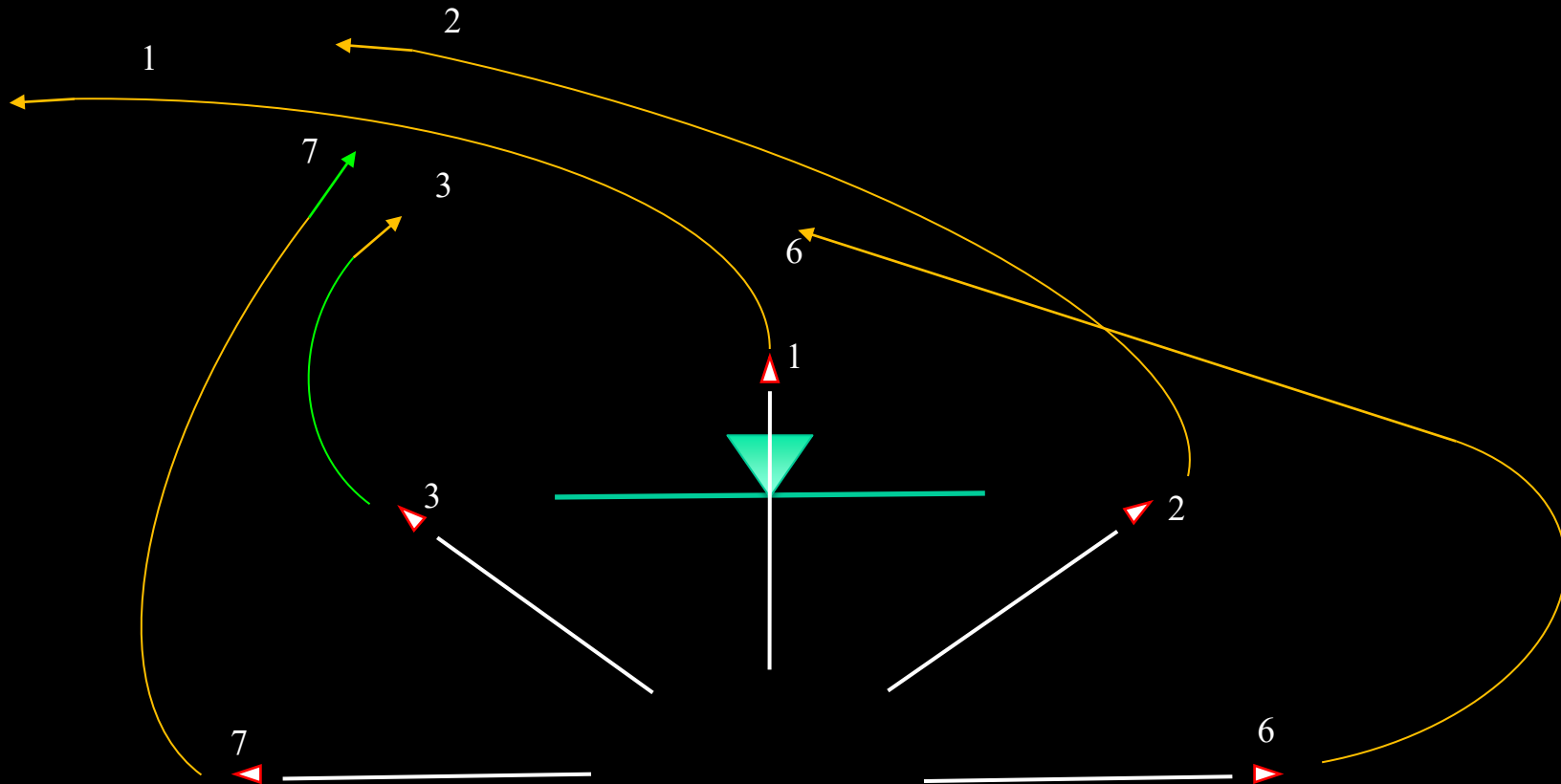


Centennial Split

Following the split of the front Vic, Snowbird 8 calls for the split of Snowbirds 4, 5, 8 and 9. An inward burst is initiated, with Stems climbing 45 degrees and the Solos split to the line.

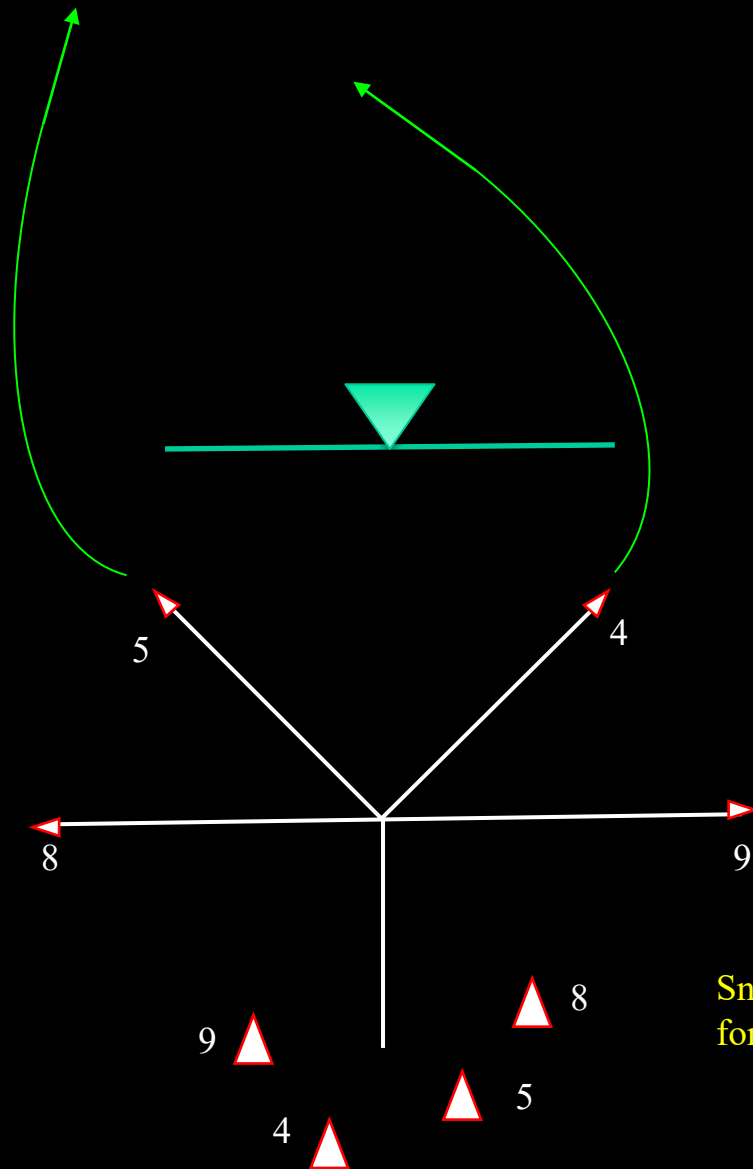


Centennial Split



Rejoin

Post Smoke off, all players climb above 1000 feet AGL before transitioning deadside. Snowbirds 1-7 rejoin deadside. Rejoin order 1-3-2-7-6-5-4.



Snowbird 5 and 4 rejoin with the main formation deadside. Solos take the line.

Rejoin Continued

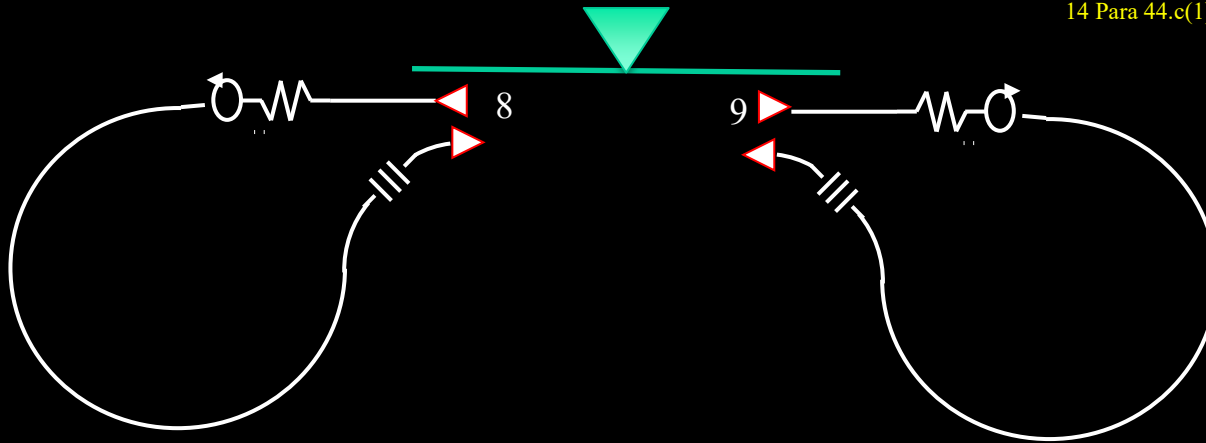
SOLO SERIES 1



—|||— = Descent

—∩— = Climb

○ = Roll



This is a permitted manoeuvre with the approval 1 Cdn Air Div Comd for aerobatic manoeuvre outside the sterile air display area below 1500 feet. BGA 100 Ch 14 Para 44.c(1)(a)

Following the Centennial Split to the line, Solos 8 & 9 fly a 270/90 reversal, conduct a Level Roll for the cross, and then exit liveside at 1000' AGL with a Pigtail.

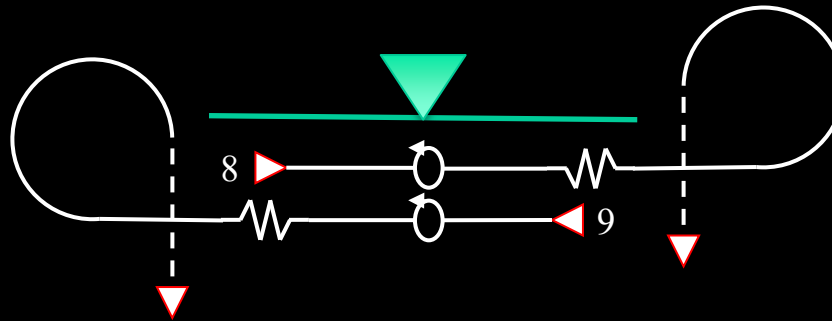
S1. 270/90...

SOLO SERIES 1

—|||— = Descent

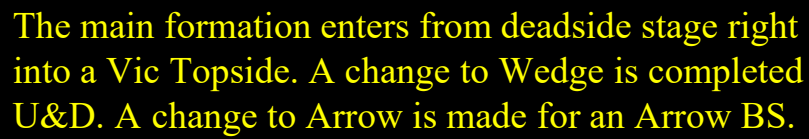
—∩— = Climb

↺ = Roll



Following the Centennial Split to the line, Solos 8 & 9 fly a 270/90 reversal, conduct a Level Roll for the cross, and then exit liveside at 1000' AGL with a Pigtail.

S1. ...Level Roll, Pigtail Exit Liveside



Vic Δ Wedge Δ Arrow BS – Stem Drop

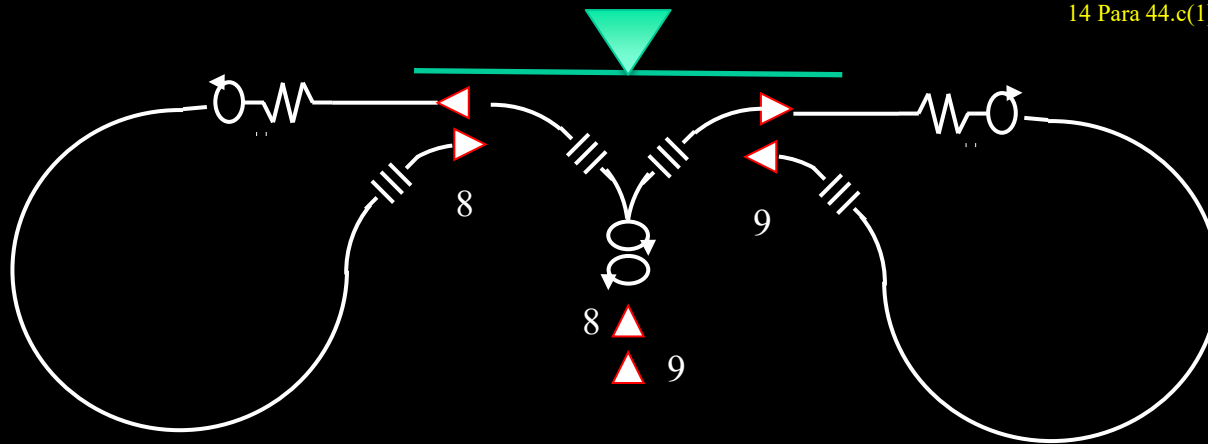
SOLO SERIES 2



—|||— = Descent

—∩— = Climb

⤵ = Roll



This is a permitted manoeuvre with the approval 1 Cdn Air Div Comd for aerobatic manoeuvre outside the sterile air display area below 1500 feet. BGA 100 Ch 14 Para 44.c(1)(a)

Solos enter from liveside for the Twizzle (if no extension, Solos will fly straight and level), fly a 270/90 reversal, and conduct a Knife Edge cross before exiting deadside to rejoin with Snowbirds 5 & 4

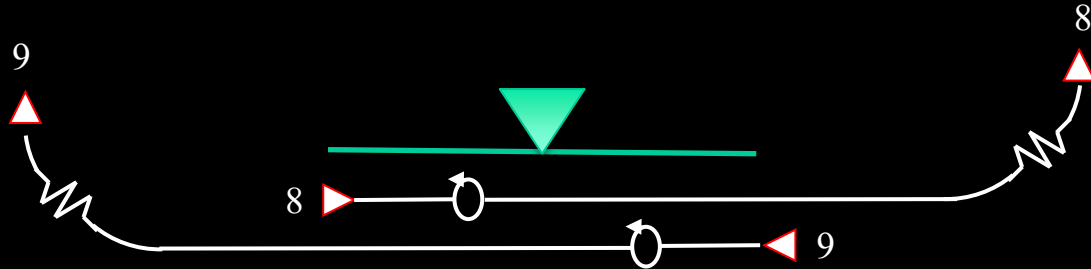
S2. Twizzle, 270/90...

SOLO SERIES 2

—|||— = Descent

—∩— = Climb

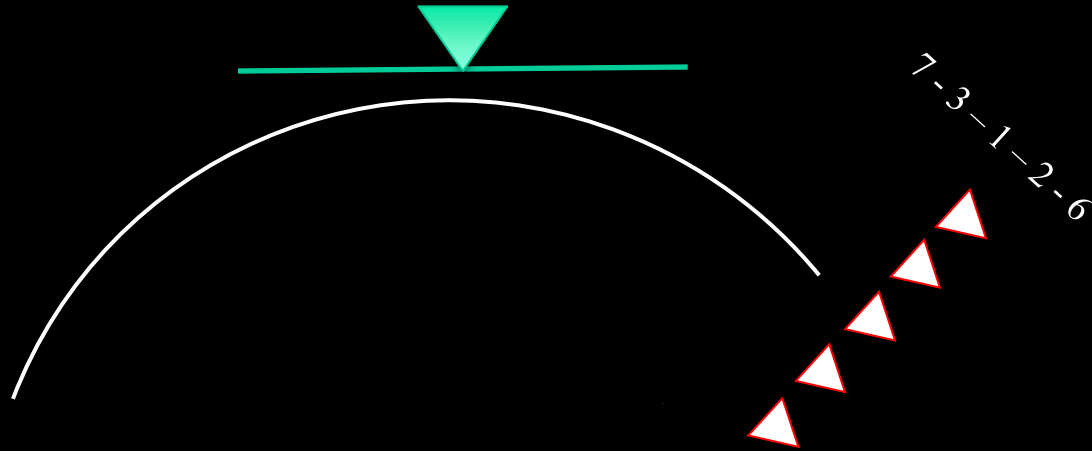
↺ = Roll



Solos enter from liveside for the Twizzle, fly a 270/90 reversal, and conduct a Knife Edge cross before exiting deadside to rejoin with Snowbirds 5 & 4

S2. ...Knife Edge, Deadside Exit

This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for non aerobatic manoeuvre by multiple aircraft in formation with an energy vector toward the primary spectator area. BGA 100 Ch 14 Para 44.c(1)(c)



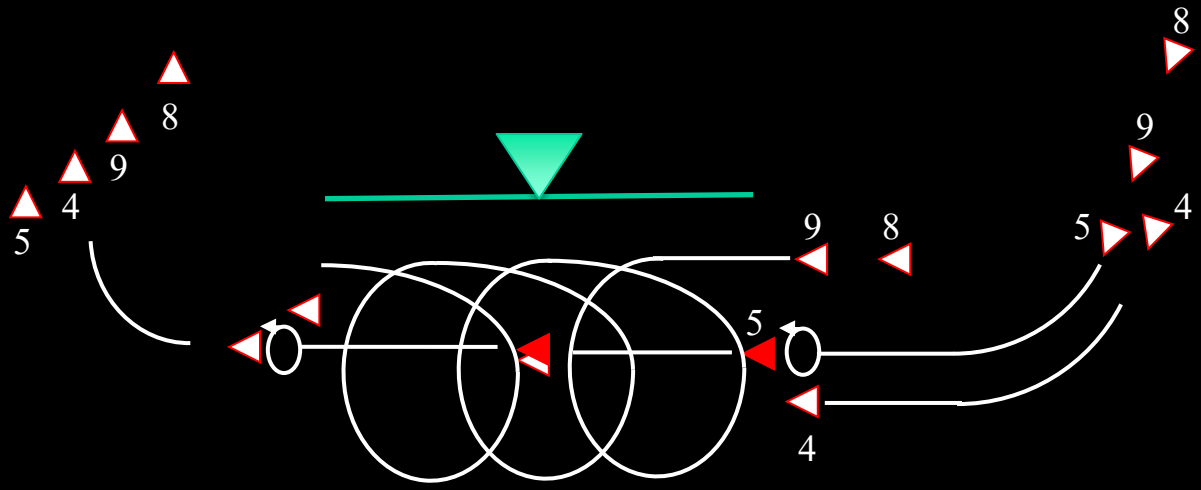
From Stage right the Snowbirds 1, 2, 3, 6, 7 perform the Line Abreast Bottom side pass.

Line Abreast Bottom Side Pass

This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for aerobatic manoeuvres which direct an energy vector toward the primary spectator area at any point. BGA 100 Ch 14 Para 44.c(1)(c)

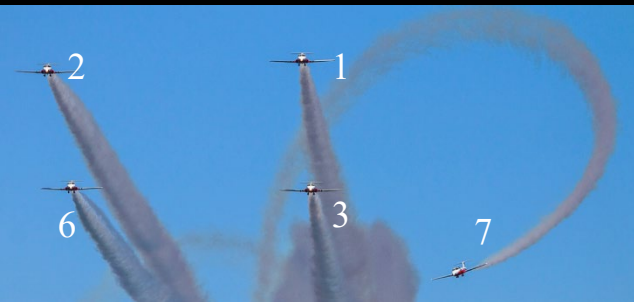
SOLO SERIES 3

- |||- = Descent
- ~ = Climb
- ⦿ = Roll

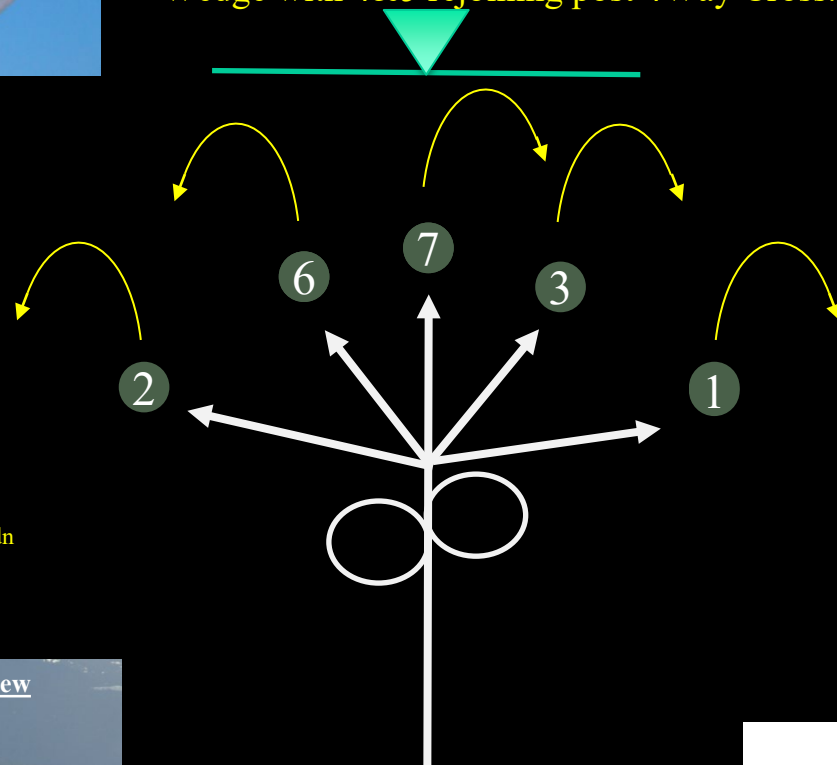


Snowbirds 5, 4, 9, and 8 will approach from stage left at 500' AGL. 5 will roll upside down, 4 will move below 5 while the Solos barrel roll in sequence around the smoke lines. On the smoke off now, 4 will call clear, 5 will roll back upright. The formation then exits deadside to reposition for the 4-Way.

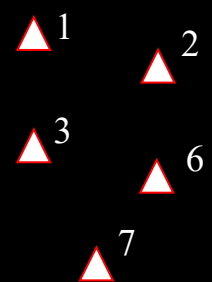
S4. Kaleidoscope



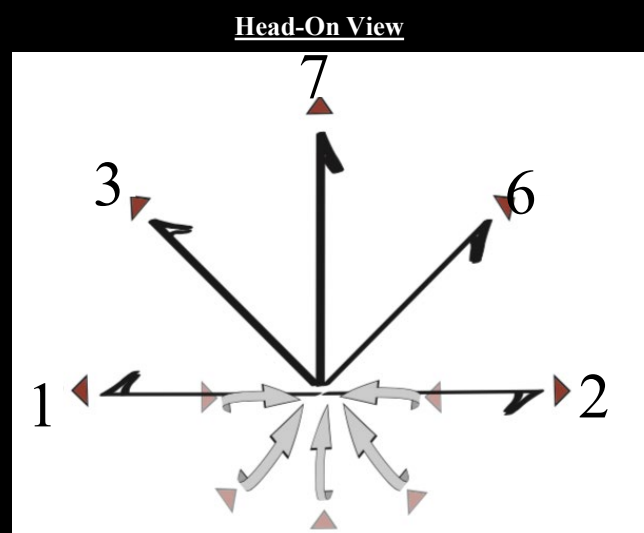
Snowbirds 1,2,3,6,7 run-in from live-side. Prior to entering the show box, Snowbird 7 executes 2 barrel rolls around the formation's flight path (if no extension, Snowbird 7 flies straight and level). An inward burst is subsequently executed prior to the 1500' show line. Lagback players exit liveside to rejoin Wedge with 4&5 rejoining post 4Way Cross.



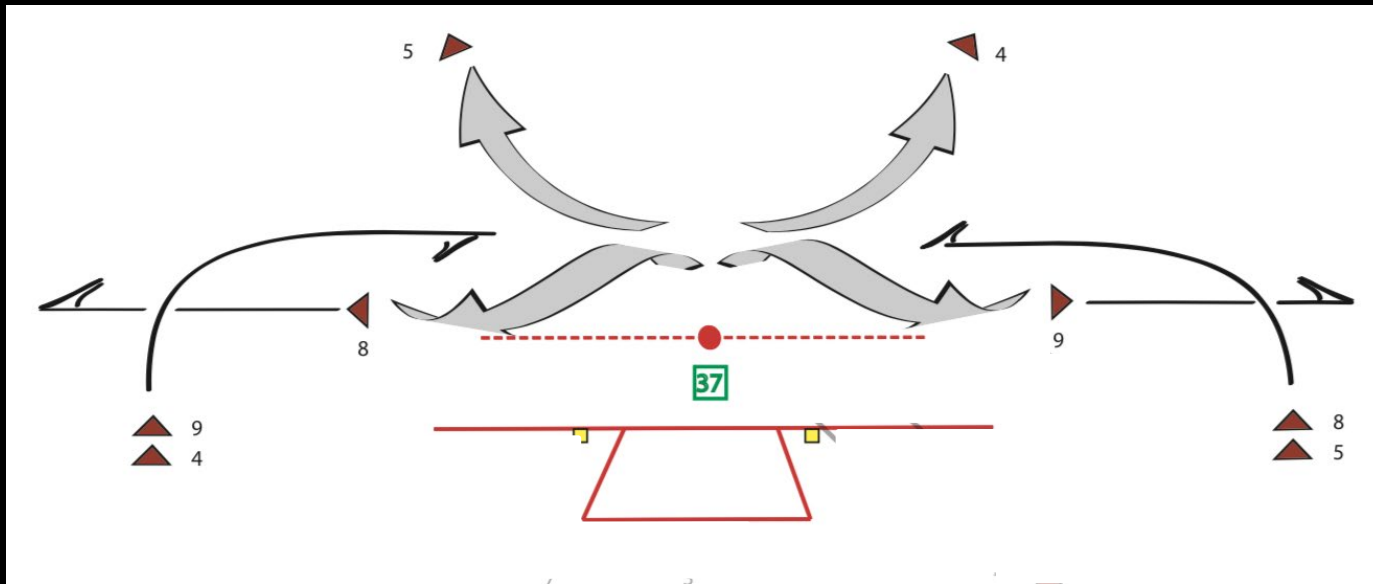
This is a permitted manoeuvre with the approval 1 Cdn Air Div Comd for aerobatic manoeuvre outside the sterile air display area below 1500 feet. BGA 100 Ch 14 Para 44.c(1)(a)



Lagback Cross



SOLO SERIES 4



Snowbirds 9/4 and 8/5 enter from stage left and right respectively and run-in along the show line to execute the 4-Way Cross whereupon Snowbird 4 & 5 exit deadside to rejoin with Snowbirds 1,2,3,6,7. Solos then fly a 270/90 reversal and conduct a Rattler Cross to exit deadside

S5. 4-Way...

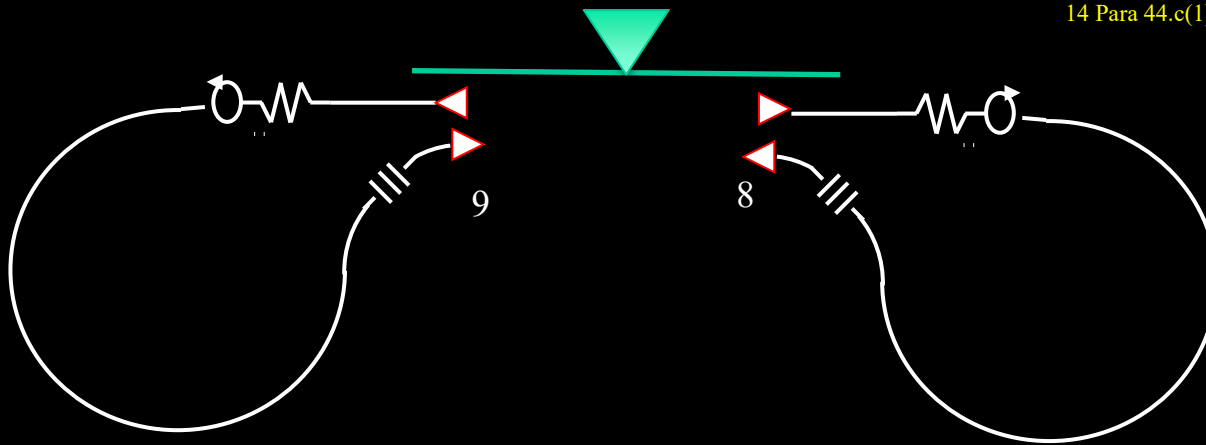
SOLO SERIES 4



—|||— = Descent

—∩— = Climb

↺
○ = Roll



This is a permitted manoeuvre with the approval 1 Cdn Air Div Comd for aerobatic manoeuvre outside the sterile air display area below 1500 feet. BGA 100 Ch 14 Para 44.c(1)(a)

Snowbirds 9/4 and 8/5 enter from stage left and right respectively and run-in along the show line to execute the 4-Way Cross whereupon Snowbird 4 & 5 exit deadside to rejoin with Snowbirds 1,2,3,6,7. Solos then fly a 270/90 reversal and conduct a Rattler Cross to exit deadside

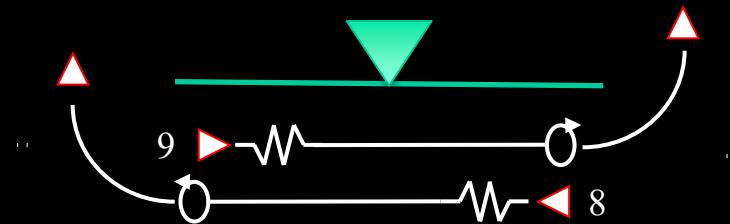
S5. ...270/90...

SOLO SERIES 4

—|||— = Descent

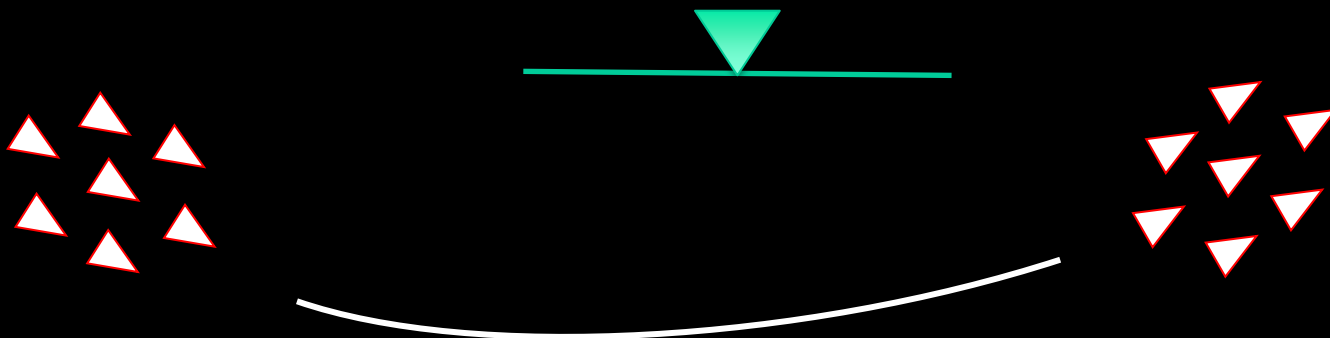
—⌒— = Climb

↺
○ = Roll



Snowbirds 9/4 and 8/5 enter from stage left and right respectively and run-in along the show line to execute the 4-Way Cross whereupon Snowbird 4 & 5 exit deadside to rejoin with Snowbirds 1,2,3,6,7. Solos then fly a 270/90 reversal and conduct a Rattler Cross to exit deadside at 1000' AGL

S5. ...Rattler Deadside Exit



From Stage Right 1-7 fly past for the Double Diamond Topside, exiting Stage Left.

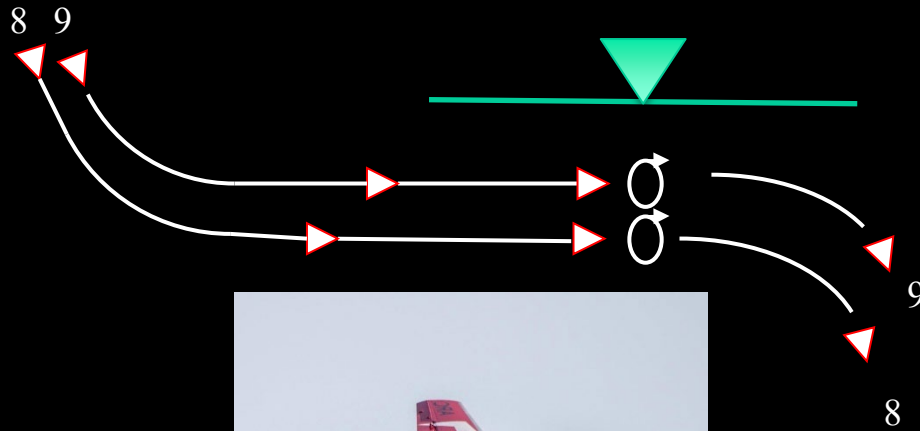
Double Diamond Topside

SOLO SERIES 5

—|||— = Descent

—∩— = Climb

↺ = Roll



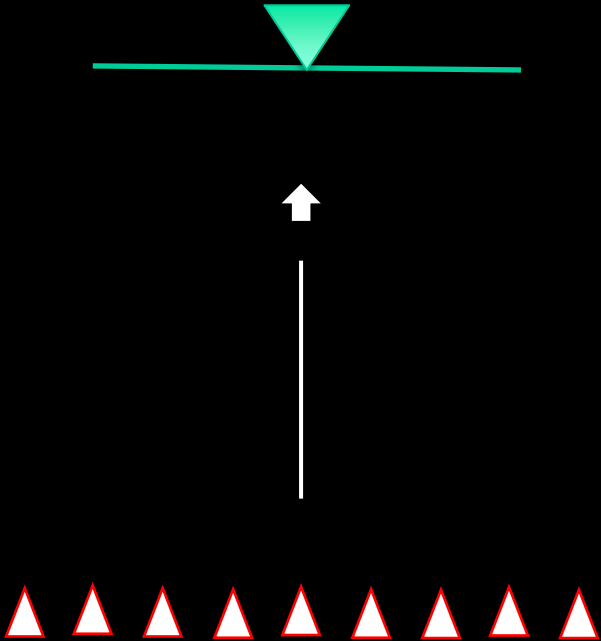
Solos will follow the Double Diamond Topside with the Yogi Roll. They approach from stage right with 8 hiding behind 9. Upon passing show center, both solos simultaneously roll left for a $\frac{3}{4}$ roll that will have them exit liveside to rejoin the main formation

S5. Yogi Roll, Exit Liveside to Rejoin

Following the Solo rejoin, the Team changes into Big Vic, and thereafter 9 Plane Line Abreast. From Liveside, the team flies directly over stage centre, before continuing deadside.



This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for over-flight of the primary spectator area at 500 feet. BGA 100 Ch 14 Para 44.b(3)(e)

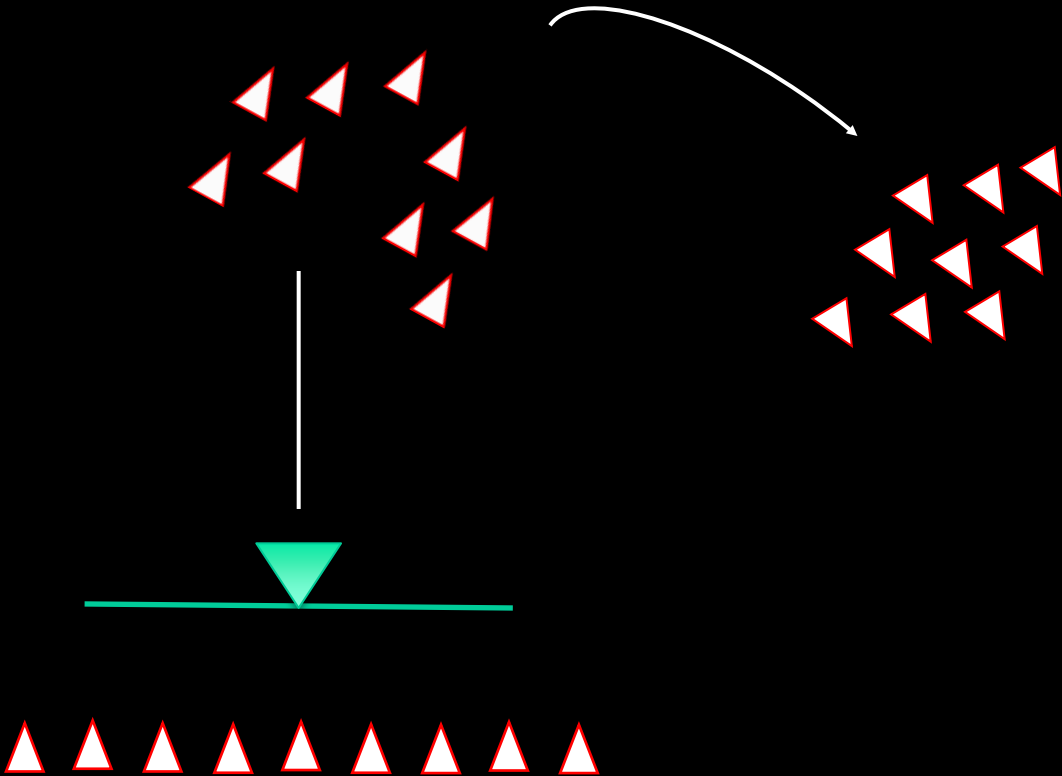


9 Plane Line Abreast

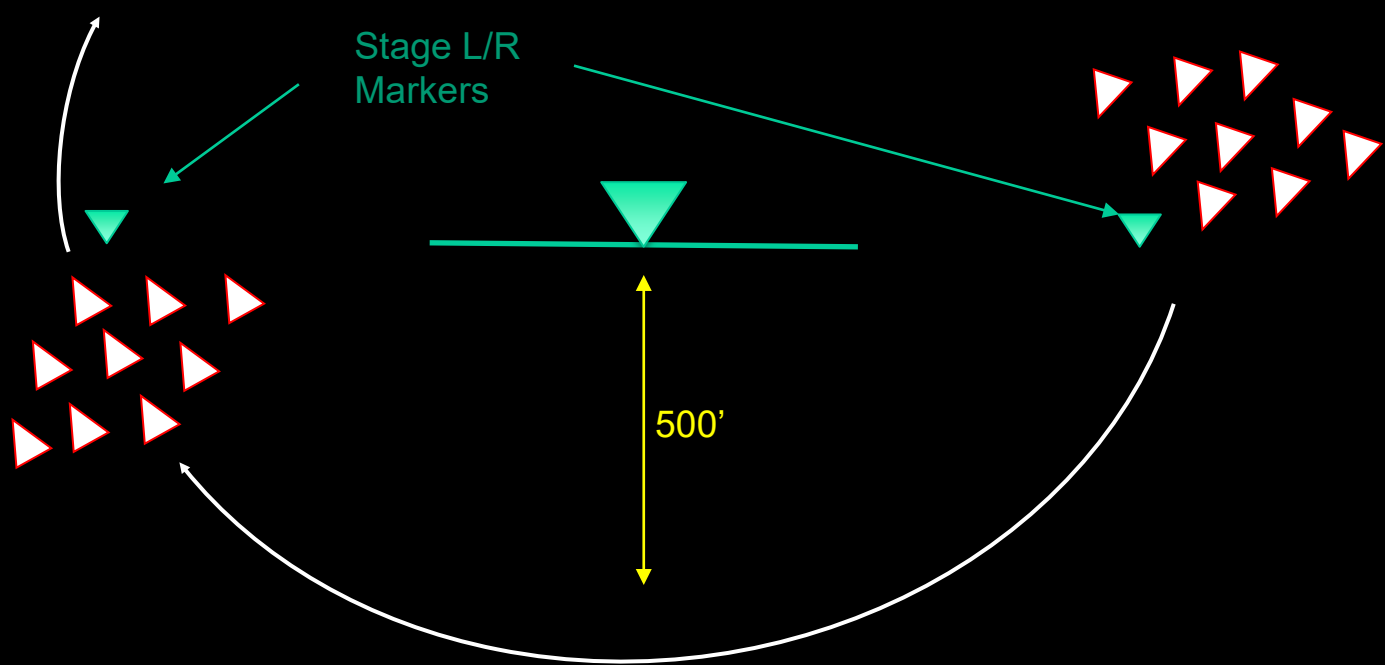
Once Deadside, the team changes to Palm, and thereafter Big Diamond, to set up for the Big Diamond Topside.



This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for over-flight of the primary spectator area at 500 feet. BGA 100 Ch 14 Para 44.b(3)(e)

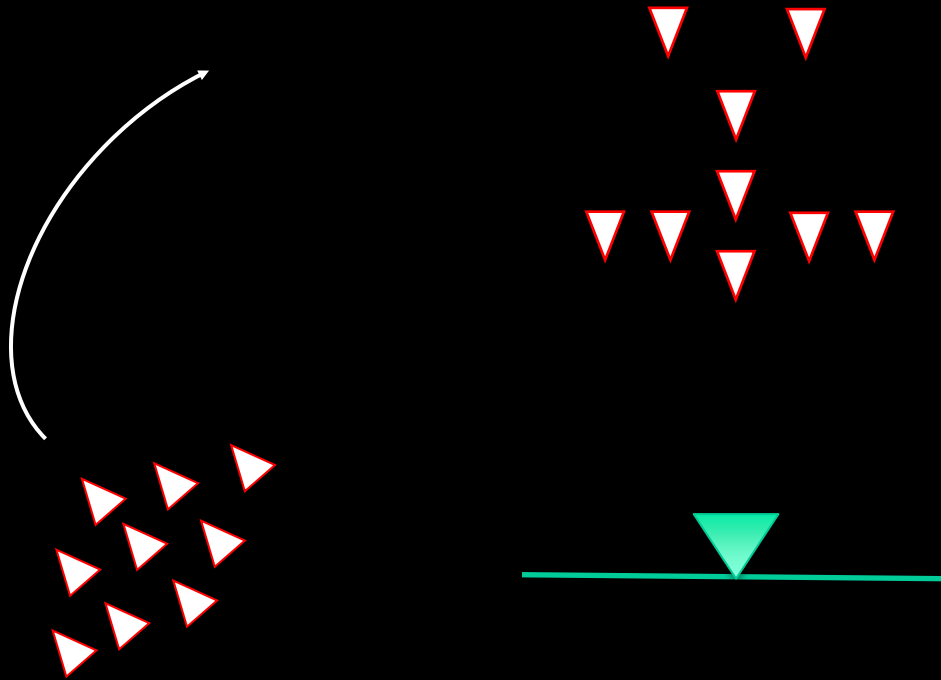


9 Plane Line Abreast



From deadside stage left, the formation flies past for the Big Diamond topside (respecting the stage left and right corner markers and minimum 500' from Primary Spectator Area).

Big Diamond Topside



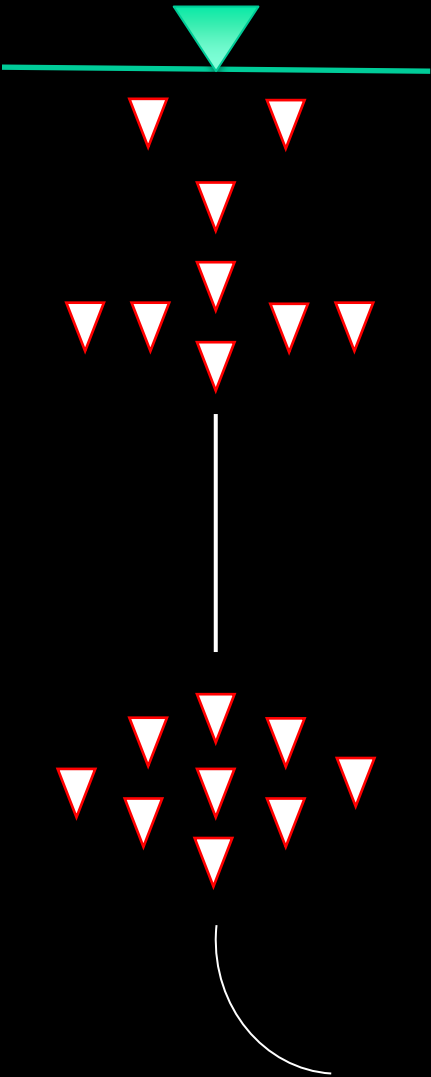
Continuing deadside, the formation changes to Big Arrow, and thereafter Inukshuk.

Big Diamond Δ Inukshuk

Running in from deadside, the team flys over stage centre for the Inukshuk overhead. The team then changes to Maple and reverses to set up for the Maple Split.



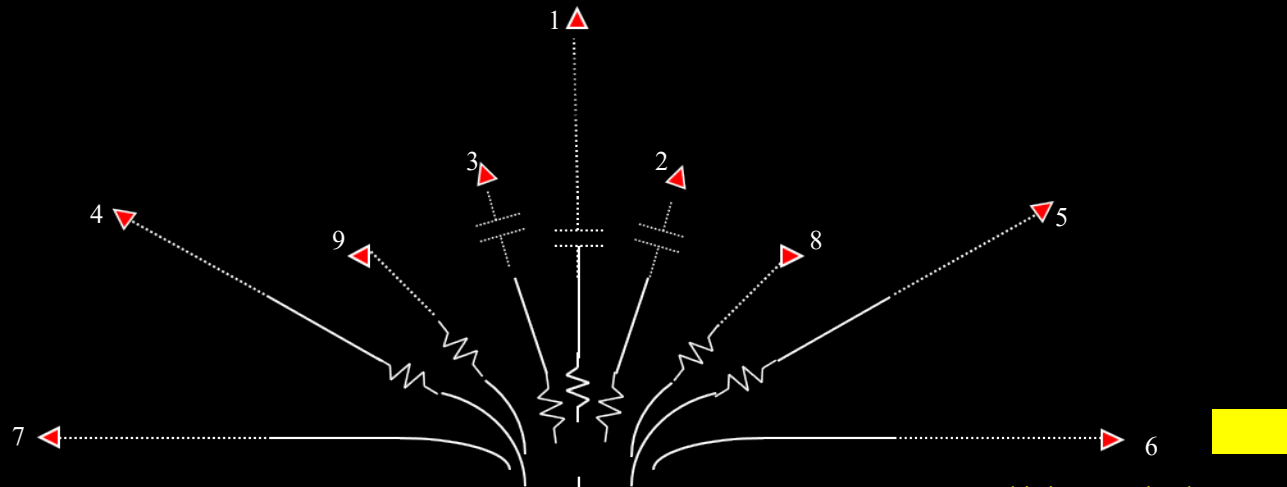
This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for over-flight of the primary spectator area at 500 feet. BGA 100 Ch 14 Para 44.b(3)(e)



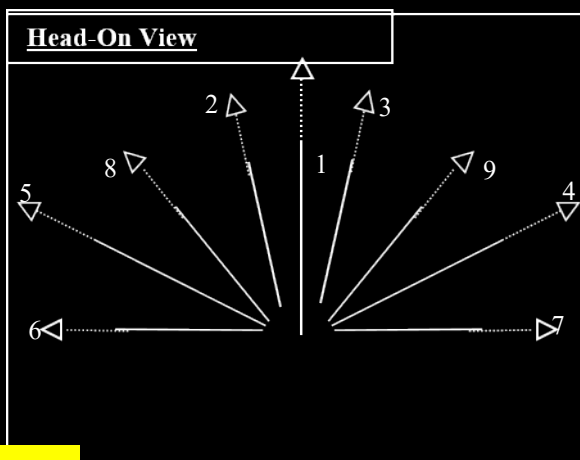
Inukshuk Overhead



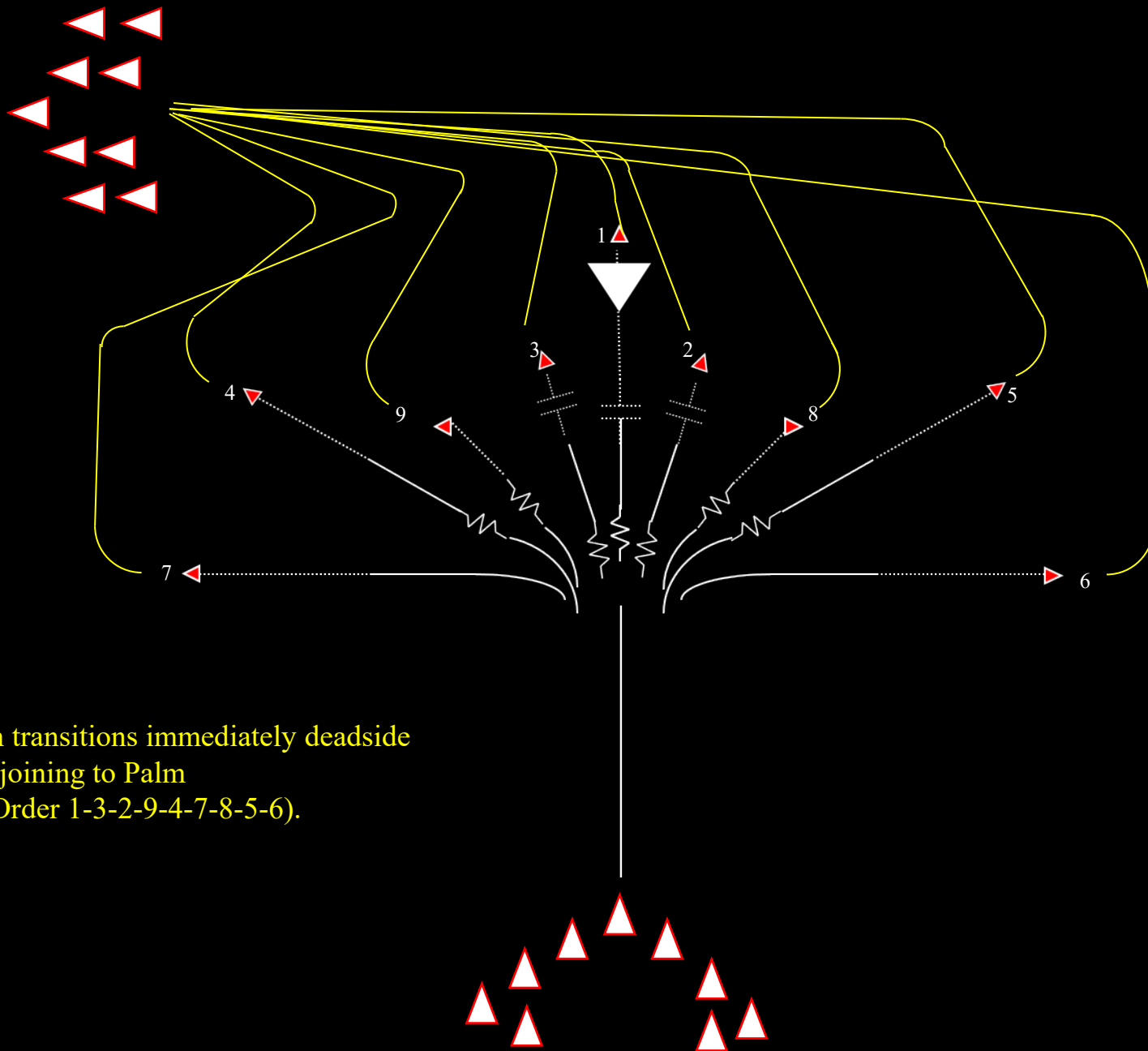
Running in from liveside, the Snowbirds ease up and split. Lines are as depicted.



This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for over-flight of the primary spectator area at 500 feet. BGA 100 Ch 14 Para 44.b(3)(c)



Maple Split




The team transitions immediately deadside before rejoining to Palm (Rejoin Order 1-3-2-9-4-7-8-5-6).

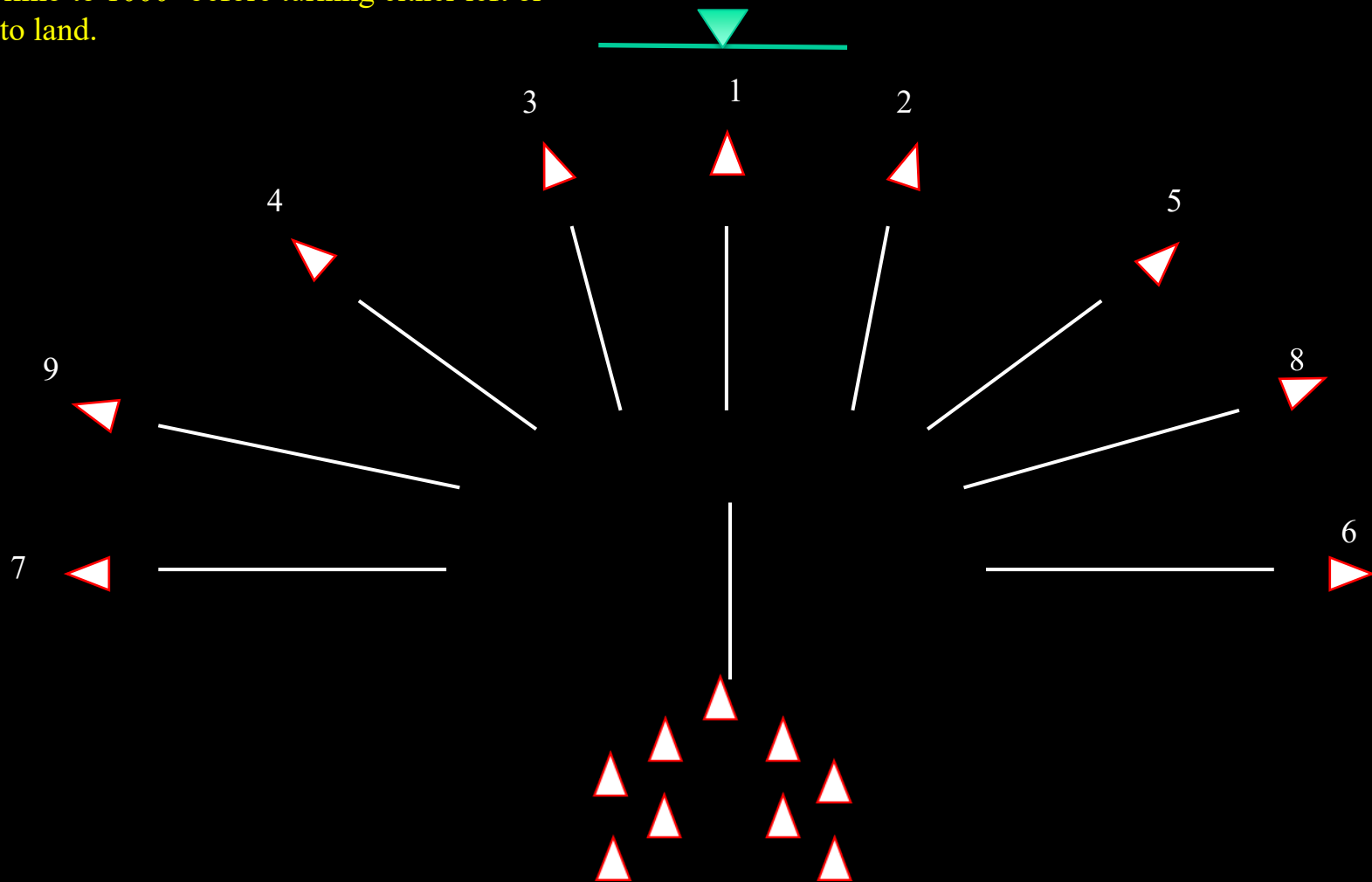
Maple Split

Encore

Pending show site, transit fuel and WX considerations,
After 9 Plane LA, Snowbird 1 will finish the show with
BD TOP, BoB, or the Palm Outward to Land.

The main formation enters from liveside overhead and commence a level split at 500'. Snowbird 1 calls: outers, solos, stems, and inner in successive order, where each Snowbird will commence a level split to their normal Palm Split line. At the Smoke off call, all Snowbirds will climb to 1000' before turning either left or right to land.

 This is a permitted manoeuvre with the approval of 1 Cdn Air Div Comd for over-flight of the primary spectator area at 500 feet. BGA 100 Ch 14 Para 44.b(3)(e)



Palm Outward to Land