



2024 COMACC Certification Guide



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LIEUTENANT COLONEL NATHAN C. MALAFA

Lt. Col. Nathan C. Malafa is the Commander/Leader for the United States Air Force Air Demonstration Squadron, the Thunderbirds, Nellis Air Force Base, Nevada. He is responsible for a 135-person squadron that plans and presents precision aerial maneuvers to exhibit the capabilities of the F-16 and the high degree of professional skill required to operate those aircraft. As Thunderbird 1, he flies the #1 jet and leads the Thunderbirds' signature flying formations to inspire communities across the world. He is in his first season with the team.

Lt. Col. Malafa commissioned in 2005 from Purdue University's Air Force Reserve Officer Training Corps as a distinguished graduate. He attended Euro-NATO Joint Jet Pilot Training and completed F-15E formal training. After serving in four fighter squadrons, he graduated in the U.S. Air Force Weapons School with honors and transitioned to F-35A Operational Test. He is a command pilot who has led combat missions in support of Operations Enduring Freedom, Inherent Resolve and Resolute Support. Prior to joining the Thunderbirds, Lt. Col. Malafa served as the Commander for the 59th Test and Evaluation Squadron.



EDUCATION

2005 Bachelor of Science, Aviation Science, Purdue University, West Lafayette, Ind.

2012 Squadron Officer School, Maxwell Air Force Base, Ala.

2012 Master of Aeronautical Science, Embry-Riddle Aeronautical University
Worldwide

2014 U.S. Air Force F-15E Weapons Instructor Course, Nellis AFB, Nev.

2017 Air Command and Staff College, Maxwell AFB, Ala., by correspondence

2019 Combat Air Force 11F Fellowship, HQ Pacific Air Forces, Joint Base Pearl Harbor-Hickam, Hawaii

ASSIGNMENTS

1. June 2005–July 2006, Student, Euro-NATO Joint Jet Pilot Training, Sheppard Air Force Base, Texas
2. July 2006–August 2006, Student, Introduction to Fighter Fundamentals, Sheppard AFB, Texas
3. August 2006–August 2007, Student, F-15E Formal Training Course, Seymour Johnson AFB, N.C.
4. August 2007–May 2010, Training and Weapons Officer, 335th Fighter Squadron, Seymour Johnson AFB, N.C.
5. May 2010–February 2013, F-15E Instructor Pilot, 334th Fighter Squadron, Seymour Johnson AFB, N.C.
6. February 2013–June 2014, Chief F-15E Evaluator Pilot, 492nd Fighter Squadron, Royal Air Force Lakenheath, England
7. June 2014–October 2015, Weapons and Tactics Chief, 494th Fighter Squadron, RAF Lakenheath, England
8. October 2015–August 2018, Assistant Director of Operations, 422nd Test and Evaluation Squadron, Nellis AFB, Nev.
9. August 2018–August 2019, Student, CAF 11F Fellowship, PACAF, Joint Base Pearl-Harbor-Hickam, Hawaii
10. August 2019–October 2020, Chief of Advanced Fighter/Bomber Requirements and Operations, PACAF, Joint Base Pearl Harbor-Hickam, Hawaii
11. October 2020–October 2021, Director of Operations, 59th Test and Evaluation Squadron, Nellis AFB, Nev.
12. October 2021–December 2023, Commander, 59th Test and Evaluation Squadron, Nellis AFB, Nev.
13. December 2023–present, Thunderbird 1, Commander/Leader, U.S. Air Force Air Demonstration Squadron, Nellis AFB, Nev.

FLIGHT INFORMATION

Rating: command pilot

Flight Hours: more than 2,700, including more than 844 combat hours

Aircraft Flown: T-37, T-38A/C, F-15E, F-35A, F-16C/D

MAJOR AWARDS AND DECORATIONS

Defense Meritorious Service Medal

Meritorious Service Medal with one oak leaf cluster

Air Medal with eight oak leaf clusters

Air and Space Commendation Medal with two oak leaf clusters

Air and Space Achievement Medal

EFFECTIVE DATES OF PROMOTION

Second Lieutenant June 1, 2005

First Lieutenant June 1, 2007

Captain June 1, 2009

Major Dec. 1, 2015

Lieutenant Colonel Oct. 1, 2019

MAJOR ZACHARY J. TAYLOR

Maj. Zachary J. Taylor is the Left Wing pilot for the United States Air Force Air Demonstration Squadron, the Thunderbirds, Nellis Air Force Base, Nevada. As Thunderbird 2, he flies the #2 jet and serves as the dedicated Instructor Pilot for Thunderbird 1. He is in his second year with the team.

Maj. Taylor commissioned in 2013 from the University of Alabama's Air Force Reserve Officer Training Corps. He has served in numerous duties as an experienced F-15C pilot, to include instructor pilot, evaluator, flight commander, and director of staff. He is a senior pilot with more than 1,500 flying hours. Prior to joining the Thunderbirds, Maj. Taylor flew the F-15C in the 67th Fighter Squadron at Kadena Air Base, Japan.

EDUCATION

2013 Bachelor of Science, Mathematics, University of Alabama, Tuscaloosa
2020 Squadron Officer School, Maxwell Air Force Base, Ala.

ASSIGNMENTS

1. November 2013–March 2016, Student, Undergraduate Pilot Training, 14th Fighter Training Squadron, Columbus Air Force Base, Miss.
2. March 2016–September 2017, Student, F15C Formal Training Course, Klamath Falls, Ore.
3. September 2017–May 2018, F-15C Assistant Chief of Weapons, 44th Fighter Squadron, Kadena Air Base, Japan
4. May 2018–October 2019, Chief of Mobility, 44th Fighter Squadron, Kadena AB, Japan
5. October 2019–September 2020, Chief of Scheduling, 67th Fighter Squadron, Kadena AB, Japan
6. September 2020–July 2021, Flight Commander, 67th Fighter Squadron, Kadena AB, Japan
7. July 2021–November 2021, Director of Staff, F-15C Mission Commander, 67th Fighter Squadron, Kadena AB, Japan
8. November 2021–October 2022, Director of Staff, F-15C Instructor/Evaluator Pilot, 67th Fighter Squadron, Kadena AB, Japan
9. October 2022–present, Thunderbird 2, Left Wing, U.S. Air Force Air Demonstration Squadron, Nellis AFB, Nev.

FLIGHT INFORMATION

Rating: senior pilot
Flight hours: more than 1,500
Aircraft flown: T-6A, T-38C, F-15C/D, F-16C/D

MAJOR AWARDS AND DECORATIONS

Air and Space Commendation Medal with one oak leaf cluster

EFFECTIVE DATES OF PROMOTION

Second Lieutenant May 5, 2013
First Lieutenant Aug. 7, 2015
Captain Aug. 7, 2017
Major July 1, 2023



MAJOR TYLER C. CLARK

Maj. Tyler C. Clark is the Right Wing for the United States Air Force Air Demonstration Squadron, the Thunderbirds, Nellis Air Force Base, Nevada. As Thunderbird 3, he flies the #3 jet and serves as the squadron's Navigation Officer. He is in his first season with the team and is the first Air National Guard pilot to be selected as a Thunderbird demonstration pilot.

Maj. Clark commissioned in 2009 from the United States Air Force Academy. He graduated undergraduate pilot training as a distinguished graduate at Laughlin Air Force Base, Texas where he won the USAF Flying Training Award, AETC Commander's Trophy. Maj. Clark has flown the F-15C in the European and Pacific theaters. He has also served as a Fighter Fundamentals instructor. Maj. Clark separated from active duty as an F-15C Evaluator Pilot and joined the Air National Guard as a B-Course Instructor Pilot. Prior to his current assignment, he served as Chief of Scheduling, 114th Fighter Squadron, Kingsley Field Air National Guard Base, Oregon.



EDUCATION

2009 Bachelor of Science, Systems Engineering Management, U.S. Air Force Academy, Colorado Springs, Colo.

2009 Air and Space Basic Course, Maxwell AFB, Ala.

2016 Squadron Officer School, Maxwell AFB, Ala.

ASSIGNMENTS

1. March 2010–April 2011, Student, Undergraduate Pilot Training, Laughlin Air Force Base, Texas
2. July 2011–September 2011, Student, Introduction to Fighter Fundamentals, Randolph AFB, Texas
3. October 2011–May 2012, Student, F-15C Formal Training Course, 114th Fighter Squadron, Kingsley Field Air National Guard Base, Ore.
4. May 2012–April 2015, Chief of Scheduling, F-15C 4-ship Flight Lead, 493d FS, RAF Lakenheath, England
5. April 2015–February 2019, Flight Commander, T-38 IFF IP/DIP, 49th FTS, Columbus AFB, Miss.
6. February 2019–April 2019, Student, F-15C Transition Course, 114th FS, Kingsley Field ANGB, Ore.
7. April 2019–June 2023, Wing Executive Officer/F-15C Evaluator Pilot, 18th Wing, Kadena AB, Japan
8. June 2023–August 2023, Chief of Scheduling, F-15C IP, 114th FS, Kingsley Field ANGB, Ore.
9. August 2023–September 2023, Student, F-16C Senior Officer Course, 314th FS, Holloman AFB, N.M.
10. October 2023–present, Thunderbird 3, Right Wing, U.S. Air Force Air Demonstration Squadron, Nellis AFB, Nev.

FLIGHT INFORMATION

Rating: senior pilot

Flight Hours: more than 1900

Aircraft Flown: T-6A, T-38C, F-15C/D, F-16C/D

MAJOR AWARDS AND DECORATIONS

Meritorious Service Medal with one oak leaf cluster

Aerial Achievement Medal

EFFECTIVE DATES OF PROMOTION

Second Lieutenant May 27, 2009

First Lieutenant May 27, 2011

Captain May 27, 2013

Major Jan. 1, 2019

MAJOR JAKE A. IMPELLIZZERI

Maj. Jake A. Impellizzeri is the Slot Pilot for the United States Air Force Air Demonstration Squadron, the Thunderbirds, Nellis Air Force Base, Nevada. As Thunderbird 4, he flies the #4 jet and serves as squadron's Chief of Training, Chief of Standardization and Evaluation, and Chief of Scheduling. He is in his third season with the team.

Maj. Impellizzeri commissioned in 2012 from Wright State University's Air Force Reserve Officer Training Corps. He attended Euro-NATO Joint Jet Pilot Training at Sheppard AFB, Texas in 2013 before transitioning to Luke AFB, Arizona as an F-16 Replacement Training Unit student. He then served two overseas assignments in the Republic of Korea and Japan, culminating as the Commander of the Pacific Air Forces F-16 Demonstration Team. Prior to joining the Thunderbirds, he served as an F-16 Flight Evaluator and Chief of Standardization and Evaluation assigned to the 79th Fighter Squadron at Shaw Air Force Base, South Carolina.



EDUCATION

2012 Bachelor of Arts, Criminal Justice, Wright State University, Dayton, Ohio
2018 Squadron Officer School, Maxwell Air Force Base, Ala.

ASSIGNMENTS

1. October 2012–November 2014, Student, Euro-NATO Joint Jet Pilot Training, 80th Fighter Training Wing/88th Fighter Training Squadron, Sheppard Air Force Base, Texas
2. November 2014–September 2015, Student, Introduction to Fighter Fundamentals, 310th Fighter Squadron, Luke AFB, Ariz.
3. September 2015–February 2017, Chief of Scheduling, 36th Fighter Squadron, Osan Air Base, Republic of Korea
4. February 2017–May 2018, Flight Commander, Chief of Training, Chief of Standardization & Evaluation, 14th Fighter Squadron, Misawa, AB, Japan
5. May 2018–September 2020, Commander, PACAF F-16 Demonstration Team, 14th Fighter Squadron, Misawa, AB, Japan
6. September 2020–September 2021, Chief of Standardization & Evaluation, 79th Fighter Squadron, Shaw AFB, S.C.
7. September 2021–November 2022, Thunderbird 8, Advance Pilot and Narrator, U.S. Air Force Air Demonstration Squadron, Nellis AFB, Nev.
8. November 2022–November 2023, Thunderbird 3, Right Wing, U.S. Air Force Air Demonstration Squadron, Nellis AFB, Nev.
9. November 2023–present, Thunderbird 4, Slot, U.S. Air Force Air Demonstration Squadron, Nellis AFB, Nev.

FLIGHT INFORMATION

Rating: senior pilot
Flight Hours: more than 1,736
Aircraft Flown: T-6A, T-38C, F-16C/D

MAJOR AWARDS AND DECORATIONS

Air Force Commendation Medal with three oak leaf clusters

EFFECTIVE DATES OF PROMOTION

Second Lieutenant June 15, 2012
First Lieutenant Aug. 4, 2014
Captain Aug. 4, 2016
Major Oct. 1, 2021

MAJOR ERIC J. TISE

Maj. Eric J. Tise is the Lead Solo Pilot for the United States Air Force Air Demonstration Squadron, the Thunderbirds, Nellis Air Force Base, Nevada. As Thunderbird 5, he flies the #5 jet and serves as the squadron's Solo Instructor Pilot, Evaluator Pilot, Imagery Officer, Assistant Director of Operations, and Chief of Safety. He is in his second season with the team.

Maj. Tise commissioned in 2013 from the United States Air Force Academy. He completed Undergraduate Pilot Training at Laughlin Air Force Base, Texas. He went on to fly the F-16 at Aviano Air Base, Italy and Kunsan Air Base, Republic of Korea. He has flown more than 1,702 hours in the F-16. Prior to joining the Thunderbirds he was an Assistant Director of Operations, Evaluator and Instructor Pilot assigned to the 510th Fighter Squadron, Aviano Air Base, Italy.

EDUCATION

2013 Bachelor of Science, Economics, U.S. Air Force Academy, Colorado Springs, Colo.

2019 Squadron Officer School, Maxwell AFB, Ala.

ASSIGNMENTS

1. August 2013–August 2015, Student, Undergraduate Pilot Training, 47th Flying Training Squadron, Laughlin Air Force Base, Texas
2. August 2015–September 2016, Student, Introduction to Fighter Fundamentals, 314th Fighter Training Unit, Holloman AFB, N.M.
3. September 2016–January 2017, Squadron Scheduler, 555th Fighter Squadron, Aviano Air Base, Italy
4. January 2017–August 2018, Security Manager, 555th Fighter Squadron, Aviano AB, Italy
5. August 2018–November 2019, Flight Commander, 80th Fighter Squadron, Kunsan AB, Korea
6. November 2019–June 2020, Chief of Standardization and Evaluation, 8th Operations Group, Kunsan AB, Korea
7. June 2020–January 2022, Flight Commander, 510th Fighter Squadron, Aviano AB, Italy
8. January 2022–October 2022, Assistant Director of Operations, 510th Fighter Squadron, Aviano AB, Italy
9. October 2022–October 2023, Thunderbird 6, Opposing Solo, U.S. Air Force Air Demonstration Squadron, Nellis AFB, Nev.
10. October 2023–present, Thunderbird 5, Lead Solo, U.S. Air Force Air Demonstration Squadron, Nellis AFB, Nev.

FLIGHT INFORMATION

Rating: senior pilot

Flight hours: more than 1,702, including more than 450 combat hours

Aircraft flown: T-6A, T-38C, F-16C/D

MAJOR AWARDS AND DECORATIONS

Air Medal with two oak leaf clusters

Air Force Commendation Medal with two oak leaf clusters

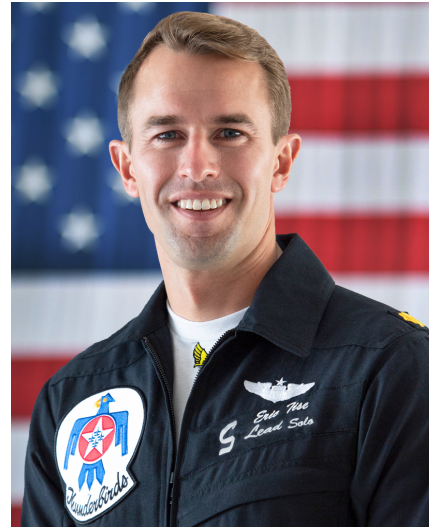
EFFECTIVE DATES OF PROMOTION

Second Lieutenant May 29, 2013

First Lieutenant May 29, 2015

Captain May 29, 2017

Major Nov. 1, 2022



MAJOR JEFFREY W. DOWNIE

Maj. Jeffrey W. Downie is the Opposing Solo for the United States Air Force Air Demonstration Squadron, the Thunderbirds, Nellis Air Force Base, Nevada. As Thunderbird 6, he flies the #6 jet and serves as the squadron's Mission Planning Officer and Applicant Officer. He is in his second season with the team.

Maj. Downie commissioned in 2013 from the United States Air Force Academy. He completed Undergraduate Pilot Training at Laughlin AFB, Texas in 2013 before transitioning to Holloman Air Force Base, New Mexico for the F-16 basic course. He went on to fly the F-16 at Shaw Air Force Base, South Carolina, and Kunsan Air Base, Republic of Korea. He is a senior pilot with more than 1,650 flying hours. Prior to joining the Thunderbirds, he served as an Instructor Pilot for T-38C Introduction to Fighter Fundamentals, assigned to the 435th Fighter Training Squadron at Joint Base San Antonio-Randolph.



EDUCATION

2013 Bachelor of Science, Aeronautical Engineering, U.S. Air Force Academy, Colorado Springs, Colo.
2019 Squadron Officer School, Maxwell Air Force Base, Ala.

ASSIGNMENTS

1. August 2013–July 2015, Student, Undergraduate Pilot Training, 47th Flying Training Squadron, Laughlin Air Force Base, Texas
2. July 2015–June 2016, Student, Introduction to Fighter Fundamentals, 311th Fighter Training Squadron, Holloman AFB, N.M.
3. June 2016–January 2017, Pilot, 77th Fighter Squadron, Shaw AFB, S.C.
4. January 2017–April 2018, Weapons and Tactics Academics Officer, 77th Fighter Squadron, Shaw AFB, S.C.
5. April 2018–May 2019, Chief of Scheduling, 77th Fighter Squadron, Shaw AFB, S.C.
6. May 2019–October 2019, Instructor/Evaluator Pilot, F-16, 8th Operational Support Squadron, Kunsan AB, Korea
7. October 2019–September 2020, Flight Commander, F-16 Evaluator Pilot, 80th Fighter Squadron, Kunsan AB, Korea
8. September 2020–August 2021, Assistant Director of Operations/T-38C IFF instructor pilot, 435th Fighter Training Squadron, Joint Base San Antonio-Randolph, Texas
9. August 2021–October 2022, Chief of Standardization and Evaluation, 435th Fighter Training Squadron, Joint Base San Antonio-Randolph, Texas
10. October 2022–October 2023, Thunderbird 8, Advance Pilot and Narrator, U.S. Air Force Air Demonstration Squadron, Nellis AFB, Nev.
11. October 2023–present, Thunderbird 6, Opposing Solo, U.S. Air Force Air Demonstration Squadron, Nellis AFB, Nev.

FLIGHT INFORMATION

Rating: senior pilot
Flight Hours: more than 1,650, including more than 377 combat hours
Aircraft Flown: T-6A, T-38C, F-16C/D

MAJOR AWARDS AND DECORATIONS

Meritorious Service Medal with one oak leaf cluster
Air Medal with "C" device and three oak leaf clusters
Air and Space Commendation Medal with one oak leaf cluster

EFFECTIVE DATES OF PROMOTION

Second Lieutenant May 29, 2013
First Lieutenant May 29, 2015
Captain May 29, 2017
Major Oct. 1, 2022

LIEUTENANT COLONEL TAYLOR R. WIGHT

Lt. Col. Taylor R. Wight is the Director of Operations for the United States Air Force Air Demonstration Squadron, the Thunderbirds, Nellis Air Force Base, Nevada. As Thunderbird 7, he flies the #7 jet and leads the Operations Section, which includes communications, computer systems analysts, scheduling, training, standardization and evaluation, aircrew flight equipment and airlift support. He is in his second season with the team.

Lt. Col. Wight commissioned in 2008 from the U.S. Air Force Academy as a distinguished graduate. He attended pilot training at Laughlin Air Force Base and was a T-6 Pilot Instructor Training course, distinguished graduate. He is a senior pilot who led combat missions in support of Operation Inherent Resolve and has served as the F-15E Division Commander for the 422nd Test and Evaluation Squadron overseeing testing of the most advanced F-15E computer software, sensors, and weapons. Prior to joining the Thunderbirds, he served as the Chief of Advanced Programs Fighter/Bomber branch (A8Z) at Pacific Air Forces Headquarters, Joint Base Pearl Harbor-Hickam, Hawaii.



EDUCATION

2008 Bachelor of Science, Systems Engineering Management, U.S. Air Force Academy, Colorado Springs, Colo.

2012 Master in Education, Trident University International, Cypress, Calif.

2015 Squadron Officer School, Maxwell Air Force Base, Ala.

2021 Air Command and Staff College, Maxwell AFB, Ala., by correspondence

2022 Combat Air Force 11F Fellowship, HQ Pacific Air Forces, Joint Base Pearl Harbor-Hickam, Hawaii

ASSIGNMENTS

1. July 2008–April 2010, Student, Undergraduate Pilot Training, Laughlin Air Force Base, Texas, Pilot Instructor Training, Randolph Air Force Base, Texas
2. May 2010–March 2011, T-6 Instructor Pilot and Flight Scheduler, 85th Flying Training Squadron, Laughlin AFB, Texas
3. April 2011–November 2012, T-6 Category Check Pilot and Assistant Flight Commander, 85th FTS, Laughlin AFB, Texas
4. December 2012–May 2013, Flight Commander and T-6 Instructor Pilot, 85th FTS, Laughlin AFB, Texas
5. June 2013–March 2014, F-15E Student Pilot, 333rd Fighter Squadron, Seymour Johnson AFB, N.C.
6. April 2014–December 2016, F-15E Multi-Ship Flight Lead, Assistant Director of Operations, Flight Commander, Chief of Plans, and Training Officer, 335th Fighter Squadron, Seymour Johnson AFB, N.C.
7. January 2017–May 2017, F-15E Instructor Course Pilot, 334th Fighter Squadron, Seymour Johnson AFB, N.C.
8. June 2017–May 2019, F-15E Evaluator Pilot, Executive Officer and Assistant Director of Operations, 334th Fighter Squadron, Seymour Johnson AFB, N.C.
9. June 2019–July 2021, F-15E Division Commander, Operational Test Evaluator Pilot, 422nd Test and Evaluation Squadron, Nellis AFB, Nev.
10. July 2021–June 2022, Student, 11F Combat Air Force Fellowship, PACAF, Joint Base Pearl Harbor-Hickam, Hawaii
11. June 2023–February 2023, Chief of Advanced Programs Fighter/Bomber Branch, PACAF, JB Pearl Harbor-Hickam, Hawaii
12. February 2023–present, Thunderbird 7, Operations Officer, U.S. Air Force Air Demonstration Squadron, Nellis AFB, Nev.

FLIGHT INFORMATION

Rating: senior pilot

Flight hours: more than 2,800, including more than 355 combat hours

Aircraft flown: T-6A, T-38C, F-15E/D, F-16C/D

MAJOR AWARDS AND DECORATIONS

Meritorious Service Medal

Air Medal with “C” device and one oak leaf cluster

Aerial Achievement Medal

Air and Space Commendation Medal with one oak leaf cluster

EFFECTIVE DATES OF PROMOTION

Second Lieutenant May 28, 2008

First Lieutenant May 28, 2010

Captain May 28, 2012

Major Jan. 1, 2018

Lieutenant Colonel Feb. 1, 2023

MAJOR BRYCE M. TURNER

Maj. Bryce M. Turner is the Advance Pilot/Narrator for the United States Air Force Air Demonstration Squadron, the Thunderbirds, Nellis Air Force Base, Nevada. As Thunderbird 8, he flies the #8 jet and advances to show sites to coordinate the logistics for aerial demonstrations. Maj. Turner also narrates the performances, conducts orientation flights to support Air Force strategic communication goals, and serves as the primary liaison between the Thunderbirds and the air show industry. He is in his first season with the team.

Maj. Turner commissioned in 2011 from the University of Virginia's Air Force Reserve Officers Training Corps. He completed both Joint Specialized Undergraduate Pilot Training and F-16C formal training as a distinguished graduate. After serving in two fighter squadrons, he graduated from the U.S. Air Force Test Pilot School and transitioned to F-16 and T-7 Developmental Test. He is a senior pilot who has led combat missions in support of Operations Inherent Resolve and Resolute Support. Prior to joining the Thunderbirds, Maj. Turner served as the T-7A Chief Test Pilot and Integrated Test Director for the 416th Flight Test Squadron.



EDUCATION

2011 Bachelor of Science, Aerospace Engineering, University of Virginia, Charlottesville
2018 Squadron Officer School, Maxwell Air Force Base, Ala.
2020 Master of Flight Test Engineering, U.S. Air Force Test Pilot School, Edwards AFB, Calif.

ASSIGNMENTS

1. November 2011–December 2013, Student, Joint Specialized Undergraduate Pilot Training, Vance Air Force Base, Okla.
2. December 2013–February 2015, Student, Introduction to Fighter Fundamentals, Luke AFB, Ariz.
3. February 2015–August 2016, Assistant Chief of Weapons, 80th Fighter Squadron, Kunsan Air Base, Republic of Korea
4. August 2016–December 2019, Flight Commander, Instructor Pilot, 555th Fighter Squadron, Aviano AB, Italy
5. December 2019–December 2020, Student, U.S. Air Force Test Pilot School, Edwards AFB, Calif.
6. December 2020–September 2022, F-16A/B/C/D Test Pilot, 416th Flight Test Squadron, Edwards AFB, Calif.
7. September 2022–October 2023, T-7A Integrated Test Director, T-7A Chief Pilot, 416th Flight Test Squadron, Edwards AFB, Calif.
8. October 2023–present, Thunderbird 8, Advance Pilot and Narrator, U.S. Air Force Air Demonstration Squadron, Nellis AFB, Nev.

FLIGHT INFORMATION

Rating: senior pilot

Flight Hours: more than 1,600, including more than 400 combat hours

Aircraft Flown: T-6A, T-38A/C, F-16A/B/C/D, Grob 103, C-12C, R-44, T-6 SNJ, L-39C, LJ-25, AC-130J, P-51D, UH-1N, F-15E, L-29, SGS-233, HU-16, KC-135, C-17, T-33, T-7A

MAJOR AWARDS AND DECORATIONS

Meritorious Service Medal

Air Medal with two oak leaf clusters

Air and Space Commendation Medal with one oak leaf cluster

Air and Space Achievement Medal

EFFECTIVE DATES OF PROMOTION

Second Lieutenant Oct. 27, 2011

First Lieutenant Oct. 27, 2013

Captain Oct. 27, 2015

Major Aug. 1, 2021

MAJOR (DOCTOR) JACOB R. HALL

Maj. (Dr.) Jacob R. Hall is the Flight Surgeon for the United States Air Force Air Demonstration Squadron, the Thunderbirds, Nellis Air Force Base, Nevada. As Thunderbird 9, he provides primary medical care for a 135-person squadron, to include ensuring the health and fitness of eight demonstration pilots. He is in his first season with the team.

Maj. Hall enlisted in the Air Force in 2004. He served as an Airborne Cryptologic Linguist for the 97th Intelligence Squadron, Offutt AFB, Nebraska. While assigned to the 97th Intelligence Squadron he served multiple combat deployments to Southwest Asia in support of Operation Enduring Freedom. Maj. Hall graduated from Bellevue University in 2008 and commission in 2011 through Commissioned Officer Training. He received his medical doctorate degree from the Uniformed Services University of the Health Sciences School of Medicine in 2015. Maj. Hall has logged more than 1000 flight hours across 5 different airframes, including 593 combat hours. Prior to joining the Thunderbirds, he served as a Dermatologist and Flight Surgeon for the 59th Medical Specialty Squadron, Lackland AFB, Texas.



EDUCATION

2008 Associate of Communication Applied Technology, Community College of the Air Force, Maxwell AFB, Ala.

2008 Bachelor of Science, Business, Bellevue University, Bellevue, Neb.

2015 Medical Doctorate, USUHS, Bethesda, Md.

2016 Transitional Year Residency, San Antonio Uniformed Services Health Education Consortium, Texas

2022 Dermatology Residency, SAUSHEC, San Antonio, Texas

ASSIGNMENTS

1. December 2005–January 2009, Airborne Cryptologic Linguist, Offutt Air Force Base, Neb. (July – October 2006, April – July 2007, February–April 2008, Airborne Cryptologic Linguist, 763d Expeditionary Reconnaissance Squadron, Al Udeid AB, Qatar)

2. January 2009–July 2011, Airborne Cryptologic Linguist Course Supervisor, Goodfellow AFB, Texas

3. July 2011–July 2015, Medical Student, Uniformed Services University of the Health Sciences, Bethesda, Md.

4. July 2015–July 2016, Transitional Year Intern, San Antonio Uniformed Services Health Education Consortium, San Antonio, Texas

5. July 2016–July 2019, Flight Surgeon, 359th Aerospace Medicine Squadron, Joint Base San Antonio-Randolph, Texas

6. July 2019–June 2022, Dermatology Resident, 59th Medical Specialty Squadron, JBASA-Lackland, Texas

7. July 2022–September 2023, Dermatologist/Flight Surgeon, 59th MSS, JBASA-Lackland, Texas

8. September 2023–present, Thunderbird 9, Flight Surgeon, U.S. Air Force Air Demonstration Squadron, Nellis AFB, Nev.

FLIGHT INFORMATION

Rating: flight surgeon

Flight Hours: more than 1000, including more than 593 combat hours

Aircraft Flown: RC-135V, RC-135W, T-38C, T-1A, T-6A, F-16D

MAJOR AWARDS AND DECORATIONS

Air Medal with one oak leaf cluster

Air and Space Commendation Medal with three oak leaf clusters

2017 AETC Flight Surgeon of the Year

EFFECTIVE DATES OF PROMOTION

Second Lieutenant July 3, 2011

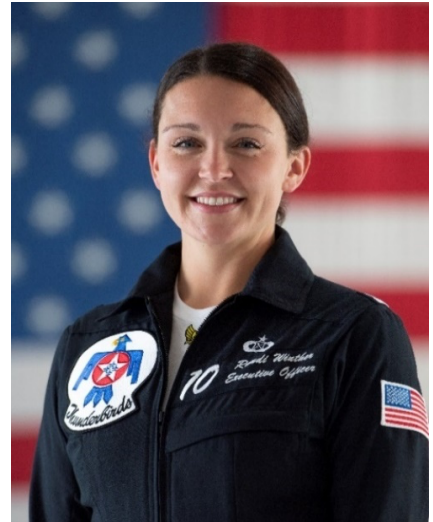
Captain May 16, 2015

Major May 16, 2021

CAPTAIN RANDI M. WINTHER

Capt. Randi M. Winther is the Executive Officer for the United States Air Force Air Demonstration Squadron, the Thunderbirds, Nellis Air Force Base, Nevada. As Thunderbird 10, she leads the executive support, commander's support staff responsible for Thunderbirds' cyberspace and knowledge operations, budget and resource management, unit training and force support actions for 135 team members. Additionally, she exercises command authority on G-series orders for day-to-day oversight of squadron operations on behalf of the Commander/Leader while he is deployed for 225 days per year. She is in her second year with the team.

Capt. Winther commissioned in 2015 from North Dakota State University's Air Force Reserve Officer Training Corps as a distinguished graduate. She received a Bachelor of Science degree in Chemistry. She went on to Operations Research Studies Analysis, Military Applications Course for technical training to become a data analyst for the Air Force. Capt. Winther then earned a Masters in Operations Research from Florida Institute of Technology. Prior to joining the Thunderbirds, she was the Director of Staff and Senior Test Analyst, 59th Test and Evaluation Squadron, Nellis Air Force Base, Nevada.



EDUCATION

2015 Bachelor of Science, Chemistry, North Dakota State University, Fargo
2016 Operations Research Studies Analysis, Military Applications Course, Fort Lee, Va.
2020 Squadron Officer School, Maxwell AFB, Ala.
2021 Master of Science, Operations Research, Florida Institute of Technology

ASSIGNMENTS

1. October 2015–August 2017, Space and Cyber Test Analyst, U.S. Air Force Operational Test and Evaluation Center, Peterson AFB, Colo.
2. August 2017–January 2019, Lead Analyst, Space Super Branch, U.S. Air Force Operational Test and Evaluation Center, Peterson AFB, Colo.
3. January 2019–August 2020, Executive Officer, U.S. Air Force Operational Test and Evaluation Center, Peterson AFB, Colo.
4. August 2020–February 2021, Analyst Flight Commander, 59th Test and Evaluation Squadron, Nellis AFB, Nev.
5. February 2021–September 2022, Director of Staff and Senior Test Analyst, 59th Test and Evaluation Squadron, Nellis AFB, Nev.
6. September 2022–present, Thunderbird 10, Executive Officer, U.S. Air Force Air Demonstration Squadron, Nellis AFB, Nev.

MAJOR AWARDS AND DECORATIONS

Meritorious Service Medal
Air Force Commendation Medal with one oak leaf cluster

EFFECTIVE DATES OF PROMOTION

Second Lieutenant May 15, 2015
First Lieutenant July 21, 2017
Captain July 21, 2019

CAPTAIN NATALEE R. WINTON

Capt. Natalee R. Winton is the Maintenance Officer for the United States Air Force Air Demonstration Squadron, the Thunderbirds, Nellis Air Force Base, Nevada. As Thunderbird 11, she leads 91 personnel across 13 distinct logistics specialties to maintain the squadron's 13 assigned F-16 aircraft and associated support equipment. She is in her first season with the team.

Capt. Winton commissioned in 2016 from Wright State University's Air Force Reserve Officer Training Corps. She completed aircraft maintenance officer training the same year and has since held multiple positions supporting sortie production at the flight, aircraft maintenance unit, squadron, and group levels. She has maintenance and sortie production experience with the F-15E, F-35A, and F-16CJ in both in-garrison and deployed roles. Capt. Winton has also deployed as a Foreign Military Sales officer where she managed the Command, Control, Communication, Computers, Information, Surveillance, and Reconnaissance portfolio in support of Operation Freedom's Sentinel and as the Fighter Generation Squadron Operations Officer providing rotational support to the U.S. Indo-Pacific Command area of responsibility. Prior to joining the Thunderbirds, she was the Operations Officer for the 391st Fighter Generation Squadron, Mountain Home Air Force Base, Idaho.



EDUCATION

2016 Bachelor of Science, Biological and Agricultural Science, Wright State University, Ohio
2016 Aircraft Maintenance Officer Course, Sheppard AFB, Texas
2018 Jet Engine Mishap Investigation Course, Sheppard AFB, Texas
2019 Masters of Leadership, Embry Riddle Aeronautical University, Fla.
2023 Advanced Maintenance Munitions Officer School, Nellis AFB, Nev.

ASSIGNMENTS

1. July 2016–April 2017, Aerospace Ground Equipment Flight Commander, 48th Equipment Maintenance Squadron, RAF Lakenheath, England
2. April 2017–July 2017, Maintenance Flight Commander, 48th Equipment Maintenance Squadron, RAF Lakenheath, England
3. July 2017–August 2018, Assistant Officer in Charge, 492nd Aircraft Maintenance Unit, RAF Lakenheath, England
4. August 2018–July 2019, Fabrication Flight Commander, 33rd Maintenance Squadron, Eglin Air Force Base, Fla.
5. July 2019–September 2020, Maintenance Operations Officer in Charge, 33rd Maintenance Group, Eglin AFB, Fla.
6. September 2020–June 2021, Executive Officer, 33rd Fighter Wing, Eglin AFB, Fla.
7. June 2021–December 2021, Director of Maintenance, 391st Fighter Squadron, Mountain Home AFB, Idaho
8. December 2021–September 2023, Operations Officer, 391st Fighter Generation Squadron, Mountain Home AFB, Idaho
9. September 2023–present, Thunderbird 11, Maintenance Officer, U.S. Air Force Air Demonstration Squadron, Nellis AFB, Nev.

MAJOR AWARDS AND DECORATIONS

Joint Service Commendation Medal
Air and Space Commendation Medal with three oak leaf clusters
Navy Achievement Medal
2022 ACC Lance P. Sijan Award Winner

EFFECTIVE DATES OF PROMOTION

Second Lieutenant April 30, 2016
First Lieutenant June 10, 2018
Captain June 10, 2020

MAJOR KRYSTAL V. JIMENEZ

Maj. Krystal V. Jimenez is the Public Affairs Officer for the United States Air Force Air Demonstration Squadron, the Thunderbirds, Nellis Air Force Base, Nevada. As Thunderbird 12, she leads a 6-person team to implement the team's extensive publicity, media, and community outreach programs. She is in her first season with the team.

Maj. Jimenez commissioned in June 2014 from the United States Air Force Academy. She earned a Bachelor of Science degree in Behavioral Science. She completed public affairs qualification training at Fort Meade, Maryland later in 2014. Maj. Jimenez has worked in a variety of roles as a public affairs officer to include Air Mobility Command, Air Combat Command, United States Air Forces in Europe and Air Forces Africa, Pacific Air Forces, and United States Cyber Command. Prior to her current assignment, she was the Chief of Public Affairs for the 366th Fighter Wing at Mountain Home AFB, Idaho.

EDUCATION

2014 Bachelor of Science, Behavioral Science, U.S. Air Force Academy, Colorado Springs, Colo.

2014 Public Affairs Qualification Course, Fort Meade, Md.

2019 Squadron Officer School, Maxwell AFB, Ala.



ASSIGNMENTS

1. July 2014–January 2015, Public Affairs Officer, 22nd Air Refueling Wing, McConnell Air Force Base, Kan.
2. January 2015–June 2016, Media Operations Section Chief, 22nd Air Refueling Wing, McConnell AFB, Kan.
3. June 2016–April 2018, Chief of Public Affairs, 501st Combat Support Wing, RAF Alconbury, England
4. April 2018–February 2021, Public Affairs Advisor, 618th Air Operations Center (TACC), Scott AFB, Ill. (February 2020– December 2020, Public Affairs Advisor, Cyber National Mission Force and Election Security Group, Ft. Meade, Md.)
5. February 2021–October 2023, Chief of Public Affairs, 366th Fighter Wing, Mountain Home AFB, Idaho
6. October 2023–present, Thunderbird 12, Public Affairs Officer, U.S. Air Force Air Demonstration Squadron, Nellis AFB, Nev.

MAJOR AWARDS AND DECORATIONS

Joint Service Commendation Medal

Air Force Commendation Medal

Air Force Achievement Medal

EFFECTIVE DATES OF PROMOTION

Second Lieutenant May 28, 2014

First Lieutenant May 28, 2016

Captain May 28, 2018

Major Jan. 1, 2024

CHIEF MASTER SERGEANT HARVEY M. MCREYNOLDS

Chief Master Sgt. Harvey M. McReynolds is the Senior Enlisted Leader for the United States Air Force Air Demonstration Squadron, the Thunderbirds, Nellis Air Force Base, Nevada. Chief McReynolds advises the Commander on matters related to the training, readiness, morale, and welfare of 135 Airmen serving in 31 Air Force Specialty Codes, executing domestic and international air demonstrations in effort to recruit, retain, and inspire. He is in his second season with the team.

Chief McReynolds entered the Air Force in April 1998. Following basic military training, he attended technical training at Lackland AFB, Texas. As a Fighter Integrated Avionics Technician, he has served in various duties in the Avionics Systems career field to include as a First Sergeant. Chief McReynolds has deployed to Afghanistan and Kuwait in support of Operations Enduring Freedom, Southern Watch, and Freedom's Sentinel. Prior to joining the Thunderbirds, he was the Senior Enlisted Leader, 356th Aircraft Maintenance Unit, Eielson Air Force Base, Alaska.



EDUCATION

2002 Airman Leadership School, Hill Air Force Base, Utah
2011 U.S. Air Force Noncommissioned Officer Academy, Maxwell AFB, Gunter Annex, Ala.
2012 Associate in Applied Science, Avionics Systems Technology, Community College of the Air Force, Maxwell AFB, Ala.
2013 Senior Enlisted Joint Professional Military Education, Maxwell AFB, Ala., by correspondence
2013 First Sergeant Academy, Maxwell AFB, Gunter Annex, Ala.
2014 U.S. Air Force Senior Noncommissioned Officer Academy, Maxwell AFB, Ala., by correspondence
2015 Associate in Applied Arts, Human Resource Management, CCAF, Maxwell AFB, Ala.
2016 U.S. Air Force Senior Noncommissioned Officer Academy, Maxwell AFB, Gunter Annex, Ala.
2018 Master Resiliency Trainer Course, Maxwell AFB, Ala.
2018 Maintenance Supervision and Production Course, McConnell AFB, Kan.
2022 Chiefs Leadership Course, Maxwell AFB, Gunter Annex, Ala.
2024 Senior Enlisted Legal Orientation Course, Maxwell AFB, Ala.
2024 Wing Command Team Course, Maxwell AFB, Ala.

ASSIGNMENTS

1. April 1998–May 1998, Student, Basic Military Training, Lackland Air Force Base, Texas
2. May 1998–February 1999, Student, Technical Training School, Lackland AFB, Texas
3. February 1999–May 2001, F-16 Avionics Systems Apprentice, 68th Fighter Squadron, Moody AFB, Ga.
4. May 2001–July 2003, F-16 Avionics Systems Journeyman, 421st Fighter Squadron, Hill AFB, Utah
5. July 2003–June 2004, F-16 Avionics System Craftsman, 51st Aircraft Maintenance Unit, Osan Air Base, Korea
6. June 2004–October 2006, Specialist Expeditor, 524th Aircraft Maintenance Unit, Cannon AFB, N.M.
7. October 2006–November 2010, Avionics Technician, Assistant Dedicated Crew Chief, U.S. Air Force Air Demonstration Squadron, Nellis AFB, Nev.
8. November 2010–September 2013, Specialist Expeditor, Tomahawk Aircraft Maintenance Unit, Nellis AFB, Nev.
9. September 2013–May 2015, First Sergeant, 548th Operations Support Squadron, Beale AFB, Calif
10. May 2015–April 2016, First Sergeant, 9th Intelligence Squadron, Beale AFB, Calif.
11. April 2016–August 2017, First Sergeant, 48th Intelligence Squadron, Beale AFB, Calif.
12. August 2017–March 2018, Specialist Section Chief, 99th Aircraft Maintenance Unit, Beale AFB, Calif.
13. March 2018–September 2019, U-2 Lead Production Superintendent, 99th Aircraft Maintenance Unit, Beale AFB, Calif.
14. September 2019–September 2020, Assistant Superintendent, 18th Aircraft Maintenance Unit, Eielson AFB, Alaska
15. September 2020–September 2021, Superintendent, 353rd Combat Training Squadron, Eielson AFB, Alaska
16. September 2021–September 2022, Senior Enlisted Leader, 356th Aircraft Maintenance Unit, Eielson AFB, Alaska
17. September 2022–present, Senior Enlisted Leader, U.S. Air Force Air Demonstration Squadron, Nellis AFB, Nev.

MAJOR AWARDS AND DECORATIONS

Meritorious Service Medal with two oak leaf clusters
Air Force Commendation Medal with four oak leaf clusters
Air Force Achievement Medal with one oak leaf cluster

EFFECTIVE DATES OF PROMOTION

Airman First Class April 22, 1998
Senior Airman Aug. 22, 2000
Staff Sergeant June 1, 2002
Technical Sergeant Jan. 1, 2009
Master Sergeant May 1, 2013
Senior Master Sergeant July 1, 2018
Chief Master Sergeant July 1, 2021

MASTER SERGEANT TERRIS D. LEE

Master Sgt. Terris D. Lee is the First Sergeant, United States Air Force Air Demonstration Squadron, the Thunderbirds, Nellis Air Force, Nevada. He serves as the commander's advisor on matters concerning morale, welfare, enlisted career progression and mission readiness. He enforces policies and ensures all support agencies are responsive to the needs of unit personnel and their families. He is in his second season with the team.

Master Sgt. Lee entered the Air Force in August 2003. Following basic military training, he attended Signals Intelligence Analysis and Reporting training at Goodfellow Air Force Base in October 2003 and has held various duties in the intelligence career field. As an intelligence analyst, Master Sgt. Lee worked both national and tactical level intelligence missions, targeting high level insurgency groups. While assigned to the 693rd Intelligence, Surveillance, and Reconnaissance Group, he led the signals reporting team in support of Operation Inherent Resolve. Prior to joining the Thunderbirds, he was the First Sergeant, 66th Rescue Squadron, Nellis Air Force Base, Nevada.



EDUCATION

2003 Air Force Basic Military Training, Lackland Air Force Base Air Force Base, Texas
2003 Intelligence Network Analyst Apprentice Course, Goodfellow AFB, Texas
2008 Airmen Leadership School, Shaw AFB, S.C.
2010 Associate of Applied Science, Intelligence Analysis, CCAF, Maxwell-Gunter AFB, Ala.
2011 Associate of Applied Science, Instructor of Technology and Military Science, CCAF, Maxwell-Gunter AFB, Ala.
2015 Noncommission Officer Academy, Air University, Maxwell-Gunter AFB, Ala., by correspondence
2016 Senior Enlisted Joint Professional Military Education Course-Level I, by correspondence
2018 Senior Noncommissioned Officer Academy, Air University, Maxwell-Gunter AFB, Ala., by correspondence
2019 Senior Enlisted Joint Professional Military Education Course-Level II, by correspondence
2020 First Sergeant Academy, Air University, Maxwell-Gunter AFB, Ala.

ASSIGNMENTS

1. August 2003-October 2003, Student, 331st Training Squadron, Lackland AFB Texas
2. October 2003-April 2004, Student, 316th Training Reconnaissance Squadron, Goodfellow AFB, Texas
3. April 2004-April 2005, Assistant Dorm Manager, 31st Intelligence Squadron, Fort Gordon, Ga.
4. April 2005-April 2006, Middle East-North Africa Operations Intelligence Analyst, 31st IS, Fort Gordon, Ga.
5. April 2006-November 2008, Iraq Counter-terrorism Analyst, 31st Intelligence Squadron, Fort Gordon, Ga.
6. November 2008-May 2010, Dirty Warrior Analyst, Fort Gordon, Ga.
7. June 2010-July 2012, Faculty Development Instructor, 17th Training Support Squadron, Goodfellow AFB, Texas
8. July 2012-January 2013, Signals Intelligence Analyst, Combined Intelligence Fusion Cell-Ankara, Ankara, Turkey
9. January 2013-July 2014, Faculty Development Instructor, 17th Training Support Squadron, Goodfellow AFB, Texas
10. July 2014-June 2017, Noncommissioned Officer in Charge, Signal Intelligence Reporting, 24th IS, Ramstein Air Base, Germany
11. June 2017-October 2018, NCOIC, Signal Intelligence Weapons and Tactics, 450th Intelligence Squadron, Ramstein AB, Germany
12. October 2018-July 2020, Superintendent, Standardization and Evaluations, 693rd Intelligence Surveillance and Reconnaissance Group Staff, Ramstein AB, Germany
13. September 2020-March 2022, First Sergeant, 66th Rescue Squadron, Nellis AFB, Nev.
14. March 2022-present, First Sergeant, U.S. Air Force Air Demonstration Squadron, Nellis AFB, Nev.

MAJOR AWARDS AND DECORATIONS

Meritorious Service Medal with one oak leaf cluster
Air Force Commendation Medal with one oak leaf cluster
Joint Service Achievement Medal
Air Force Achievement Medal with one oak leaf cluster

EFFECTIVE DATES OF PROMOTION

Airman First Class Aug. 26, 2003
Senior Airman Dec. 26, 2005
Staff Sergeant April 1, 2009
Technical Sergeant Nov. 1, 2015
Master Sergeant Feb. 1, 2019

2024 Show Schedule

(CAO February 21, 2024)

February 11: Las Vegas, Nevada – “Super Bowl LVIII”
February 18: Daytona Beach, Florida – “Daytona 500”
March 23-24: Luke AFB, Arizona – “Luke Days Air and Space Expo”
March 29-30: MacDill AFB, Florida – “Tampa Bay Air Fest”
April 6-7: JBSA-Randolph, Texas – “Great Texas Airshow”
April 13-14: Lakeland, Florida – “SUN ‘n FUN Aerospace Expo”
April 20-21: JB Charleston, South Carolina – “JB Charleston Air and Space Expo”
April 27-28: Sheppard AFB, Texas – “Guardians of Freedom Show”
May 4-5: Tyndall AFB, Florida – “Gulf Coast Salute”
May 11-12: Fort Lauderdale, Florida – “Air Dot Show Fort Lauderdale Air Show”
May 18-19: Duluth, Minnesota – “Duluth Air and Aviation Expo”
May 26: Indianapolis, Indiana – “Indy 500 Flyover”
May 30: USAF Academy, Colorado – “USAF Academy Graduation 2024”
June 2: Holloman AFB, New Mexico – “Legacy of Liberty”
June 8-9: Selfridge ANGB, Michigan – “Selfridge Air National Guard Base Open House and Air Show”
June 14-16: Columbus, Ohio – “Columbus Air Show”
June 29-30: Hill AFB, Utah – “Warriors over the Wasatch Air and Space Show”
July 4,6-7: Battle Creek, Michigan – “Battle Creek Field of Flight Air Show and Balloon Festival”
July 13-14: Whiteman AFB, Missouri – “Wings over Whiteman”
July 20-21: JB Elmendorf Richardson, Alaska – “Arctic Thunder Air Show and Open House”
July 24: Cheyenne, Wyoming – “Wings Over Warren/Cheyenne Frontier Days”
July 27-28: Milwaukee, Wisconsin – “Milwaukee Air and Water Show”
August 3-4: Brunswick, Maine – “Great State of Maine Air Show”
August 10-11: New Windsor, New York – “Air Dot Show New York”
August 24-25: Offutt AFB, Nebraska – “Offutt Air Force Base Air Show”
August 31- September 2: McMinnville, Oregon – “Oregon International Air Show”
September 7-8: Gatineau, Canada – “AERO Gatineau-Ottawa Airshow”
September 14-15: St. Joseph, Missouri – “Sound of Speed Open House and Air Show”
September 21-22: Columbus AFB, Mississippi – “Wings Over Columbus”
September 28-29: Salinas, California – “California International Air Show”
October 5-6: Huntington Beach, California – “Pacific Air Show”
October 12-14: Topeka, Kansas – “Thunder Over the Heartland”
October 26-27: Peachtree City, Georgia – “Air Dot Show Atlanta”
November 2-3: Ft. Worth, Texas – “Alliance Texas Aviation Airshow”

2025 Show Schedule

(CAO February 21, 2024)

February 16: Daytona 500, Florida - "Daytona 500"
March 22-23: Davis-Monthan AFB, Arizona – "Thunder & Lightning Over Arizona"
March 29-30: Barksdale AFB, Louisiana – "Defenders of Liberty Air Show"
April 5-6: Nellis AFB, Nevada – "Aviation Nation"
April 12-13: March ARB, California – "Southern California Airshow"
April 19-20: Dyess AFB, Texas – "Dyess AFB Open House"
April 26-27: JB Langley-Eustis, Virginia – "Air Power Over Hampton Roads"
May 3-4: Seymour Johnson AFB, North Carolina – "Wings Over Wayne Air Space & Technology Expo"
May 10-11: Mountain Home AFB, Idaho – "Gunfighter Skies Airshow"
May 17-18: JB McGuire-Dix-Lakehurst, New Jersey – "Power in the Pines Open House & Expo"
May 24-26: Wantagh (Jones Beach), New York – "Bethpage Air Show at Jones Beach Park"
May 29: US Air Force Academy Graduation, Colorado – "USAF Academy Graduation 2025"
June 7-8: Beale AFB, California – "Beale AFB Open House"
June 21-22: Dayton, Ohio – "Dayton Airshow"
June 28-29: Tinker AFB, Oklahoma – "Tinker Air Show"
July 4-6: Battle Creek, Michigan – "Battle Creek Field of Flight Air Show & Balloon Festival"
July 12-13: Ft. Wayne ANGB, Indiana – "Fort Wayne ANGB Open House/Airshow"
July 19-20: Kingsley Field ANGB (Klamath Falls), Oregon – "Sentry Eagle 2025 Open House"
July 23: Cheyenne, Wyoming – "Wings Over Warren/Cheyenne Frontier Days"
August 9-10: Gary, Indiana – "Gary Air Show"
August 16-17: Chicago, Illinois – "Chicago Air & Water Show"
August 23-24: Davenport, Iowa – "Quad City Air Show"
August 30-September 1: Cleveland, Ohio – "Cleveland Nation Air Show"
September 6-7: Mirabel (Montreal, Qubec), Canada – "Festival Aérien VOLARIA Airshow"
September 13-14: JB Andrews, Maryland – "JB Andrews Air Show"
September 20-21: Loveland, Colorado – "The Great Colorado Air Show"
September 27-28: Pueblo, Colorado – "Pueblo Wings of Pride Airshow"
October 4-5: Huntington Beach, California – "Pacific Airshow"
October 11-12: Peachtree, Georgia – "Air Dot Show Atlanta"
October 18-19: Houston, Texas – "Wings Over Houston Airshow"
October 25-26: Sanford, Florida – "Air Dot Show Orlando"
November 1-2: Keesler AFB/Biloxi, Mississippi – "Thunder Over the Sound: Keesler/Biloxi Air & Space Show"



DEPARTMENT OF THE AIR FORCE
USAFADS "THUNDERBIRDS" (ACC)
NELLIS AIR FORCE BASE NEVADA

10 January 2024

MEMORANDUM FOR FAA Representatives

FROM: USAFADS/CC

SUBJECT: 2024 Thunderbirds Maneuver Package

1. This United States Air Force Air Demonstration Squadron (Thunderbirds) Maneuver Package provides you with a pictorial display of demonstration maneuvers used by the Thunderbirds.
2. The Thunderbirds have three show types depending upon weather or terrain considerations. A high show, which includes formation rolls and loops, may be flown with a minimum ceiling of 6,500' and 5 nautical mile visibility. A low show, which has formation rolls only, may be flown with a minimum ceiling of 3,500' and 5 nautical mile visibility. A flat show, which includes no loops or rolls, may be flown with a minimum ceiling of 2,000' and 5 nautical mile visibility (USAFADS/CC may waive the flat show minimum ceiling to 1,500'). Transitions between show types and maneuvers occur on occasion if weather or other conditions prohibit safe execution of a given maneuver. Additionally, in the interest of pilot and public safety, show-site conditions, hazards within the TFR, and weather may drive resequencing of maneuvers or truncation of show sequence.
3. The Department of Defense accepts full responsibility for the operation of Thunderbird demonstration maneuvers as described herein. Lieutenant Colonel Nathan Malafa, Commander/Leader, USAF Air Demonstration Squadron, is the designated representative for the Department of Defense for the execution of these maneuvers and prioritizes safety over visual appeal or presentation.
4. Thunderbird maneuvering airspace and minimum dimensions for an aerobatic box are depicted in section III. The team will review and approve modification or truncation to the aerobatic box on a case-by-case basis. FAA guidelines currently permit non-aerobatic passes flown no closer than 500' from the crowd. Aerobatic maneuvers shall occur at the 1500' show line; however, non-aerobatic maneuvers may take place on the 500' show line. Non-aerobatic passes over the crowd will be a minimum of 500' AGL. Thunderbird formations in the transition area may descend from 500' to be at their minimums at 1NM from show center, even over occupied buildings. All maneuvers can transition to a flat pass if conditions dictate.
5. The Thunderbirds may fly a demonstration with less than six aircraft. Fallout of the left and right solos is depicted in the maneuvers package as 5-ship shows; any other fallout scenarios will result in an incomplete diamond with or without solos as part of the formation. The Thunderbirds will occasionally fly a seventh aircraft during Thursday or Fridays which are classified as practice demonstrations days and arrival site surveys in a photo-chase profile. This aircraft will be flown by Thunderbirds 7 or 8 upon completion of syllabus-directed training. If the seventh aircraft is a 2-seat F-16, the Thunderbirds will continue the back-seat flyer program with a designated Thunderbird team member, distinguished visitor, hometown hero or national media member upon annual approval from the FAA. The photo-chase aircraft will maneuver as required to achieve the desired photographic position relative to the diamond, solos, or delta. The same rules and regulations governing the 6-ship within the TFR and aerobatic box also apply to the seventh aircraft. The photo chase aircraft will never fly during an official demonstration.
6. My point of contact to address any questions concerning these maneuvers is Lieutenant Colonel Taylor Wight, Thunderbird Operations Officer, at (702) 271-6627 or DSN 682-9931.

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Date: 2024.01.11 09:39:26 -0800
NATHAN C. MALAFA, Lt Col, USAF
Commander/Leader

Recruit – Retain – Inspire

1st Ind, USAFADS/CC, 10 January 2024, 2024 Thunderbirds Maneuver Package

57 WG/CC

2 February 2024

MEMORANDUM FOR USAFADS/CC

Recommend: Approve/~~Disapprove~~

GOODMAN.RICHARD
RD.A.1115874817

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GOODMAN.RICHARD.A.111587481
Date: 2024.02.04 05:57:32 -0800

RICHARD A. GOODMAN
Brigadier General, USAF
Commander



DEPARTMENT OF THE AIR FORCE
USAFADS "THUNDERBIRDS" (ACC)
NELLIS AIR FORCE BASE NEVADA

12 January 2024

MEMORANDUM FOR RECORD

FROM: USAFADS/CC

SUBJECT: 2024 USAFADS "Thunderbirds" Demonstration Pilots

1. I appoint the following USAF Air Demonstration Pilots for the 2024 season:

- #1 Commander/Leader – Lt. Col. Nathan Malafa
- #2 Left Wing – Maj. Zachary Taylor
- #3 Right Wing – Maj. Tyler Clark
- #4 Slot – Maj. Jacob Impellizzeri
- #5 Lead Solo – Maj. Eric Tise
- #6 Opposing Solo – Maj. Jeffrey Downie
- #7 Operations Officer – Lt. Col. Taylor Wight
- #8 Advance Pilot/Narrator – Maj. Bryce Turner

2. For questions or concerns, please contact Capt. Randi Winther at DSN 682-9584, commercial (702) 652-9584.

MALAFANATHAN.C.12
70116864
NATHAN C. MALAFA, Lt Col, USAF
Commander/Leader

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Date: 2024.01.12 07:40:29 -08'00'

Recruit – Retain – Inspire

2024 6-SHIP SHOW

HIGH SHOW

LOW SHOW

FLAT SHOW

Diamond Takeoff / Loop on Takeoff	Low Transition Formation Takeoff	Low Transition Formation Takeoff
(6) Roll on Takeoff	(6) Roll on Takeoff	(6) Roll on Takeoff
(5) Max Climb / Split S	(5) Max Climb / Split S	(5) Low Trans Takeoff
Diamond Cloverloop Opener ⬆←	Low Opener ⬆←	Flat Opener ⬆←
Crossover Break ←⬆→	Crossover Break ←⬆→	Crossover Break ←⬆→
Diamond PIR ←	Diamond PIR ←	Diamond PIR ←
(5) Knife Edge →	(5) Knife Edge →	(5) Knife Edge →
Diamond Roll ⇒	Diamond Roll ⇒	Diamond Flat Pass ⇒
Calypso Pass ←	Calypso Pass ←	Calypso Pass ←
Echelon Pass in Review ⇒	Echelon Pass in Review ⇒	Echelon Pass in Review ⇒
(6) Sneak Pass →	(6) Sneak Pass →	(6) Sneak Pass →
(5) Slow Roll →	(5) Slow Roll →	(5) Slow Roll →
(6) Aileron Rolls ←	(6) Aileron Rolls ←	(6) Aileron Rolls ←
Bon Ton Roule ⇐	Bon Ton Roule ⇐	Bon Ton Roule ⇐
Opposing Knife Edge →←	Opposing Knife Edge →←	Opposing Knife Edge →←
Trail to Diamond BUP ⇒	Trail to Diamond BUP ⇒	Trail to Diamond BUP ⇒
Opposing Inverted →←	Opposing Inverted →←	Opposing Inverted →←
Trail to Diamond Cloverloop ⬇←	High Low Hit ←	High Low Hit ←
(5) Rejoin to Stinger (via Chaos) ←	(5) Rejoin to Stinger ←	(5) Rejoin to Stinger ←
Low Bomb Burst ⬇	Low Bomb Burst ⬇	Low Bomb Burst ⬇
(5) Rejoin to Stinger (via LBB hit) ↑	(5) Rejoin to Stinger (via LBB hit) ↑	(5) Rejoin to Stinger (via LBB hit) ↑
(6) High Alpha/Climb ←	(6) High Alpha/Climb ←	(6) High Alpha/Climb ←
5-Card Loop ←	5-Card Flat Pass ←	5-Card Flat Pass ←
(6) Vertical Rolls →	(6) 8-Point Roll →	(6) 8-Point Roll →
Line Break Loop ⇒	Stinger Break Cross ⇒	Stinger Break Cross ⇒
(6) Max Turn, 1/2 Cuban →	(6) Max Turn/Cuban →	(6) Max Turn →
Burner 360 ⬆	Burner 360 ⬆	Burner 360 ⬆
Solo Rejoin to Delta ⬆	Solo Rejoin to Delta ⬆	Solo Rejoin to Delta ⬆
Delta BUP ⇐	Delta BUP ⇐	Delta BUP ⇐
Delta Roll ⇒	Delta Roll ⇒	Delta Flat Pass ⇒
Delta Loop ⇐	Delta 360 ⇐	Delta 360 ⇐
Delta Burst ⬇	Delta Burst ⬇	Delta Burst ⬇
Opposing Split S →←	Opposing Split S / 4-Point →←	Opposing 4 Point →←
High Bomb Burst ⇒	Rapid Recovery ⬆	Rapid Recovery ⬆
Thunderbird Pitch ⇐	Thunderbird St-In	Thunderbird St-In
Reflection Pitch (Reflection Pass) ←	Solo St-In	Solo St-In

2024 5-SHIP SHOW

HIGH SHOW

LOW SHOW

FLAT SHOW

Diamond Takeoff / Loop on Takeoff		Low Transition Formation Takeoff		Low Transition Formation Takeoff	
(6) Roll on Takeoff	(5) Max Climb / Split S	(6) Roll on Takeoff	(5)Max Climb/Split S	(5 & 6) Roll on Takeoff	
Diamond Cloverloop Opener ↑←		Low Opener ↑←		Flat Opener ↑←	
Max Climb ↑		Immelmann ↑		Left Pitchback ↑	
Diamond PIR ←		Diamond PIR ←		Diamond PIR ←	
Knife Edge →		Knife Edge →		Knife Edge →	
Diamond Roll ⇒		Diamond Roll ⇒		Diamond Flat Pass ⇒	
4-Point Roll ←		4-Point Roll ←		4-Point Roll ←	
Echelon Pass in Review ⇒		Echelon Pass in Review ⇒		Echelon Pass in Review ⇒	
Sneak Pass →		Sneak Pass →		Sneak Pass →	
Aileron Rolls ←		Aileron Rolls ←		Aileron Rolls ←	
Bon Ton Roulle ⇐		Bon Ton Roulle ⇐		Bon Ton Roulle ⇐	
8-Point →		Inverted to Inverted →		Inverted to Inverted →	
Trail to Diamond BUP ⇒		Trail to Diamond BUP ⇒		Trail to Diamond BUP ⇒	
Inverted to Inverted ←		Repo for High Low Hit		Repo for High Low Hit	
Trail to Diamond Cloverloop ↓←		High Low Pass ←		High Low Pass ←	
Chaos Rejoin to Stinger ↑		Rejoin to Stinger ↑		Rejoin to Stinger ↑	
Low Bomb Burst ↓		Low Bomb Burst ↓		Low Bomb Burst ↓	
High Alpha / Muscle ←		High Alpha / Muscle ←		High Alpha / Muscle ←	
4 Card Loop ←		4 Card Flat Pass ←		4 Card Flat Pass ←	
Vertical Rolls →		8-Point Roll →		8-Point Roll →	
Line Break Loop (Slot) ⇒		Slot Break Cross ⇒		Slot Break Cross ⇒	
Max Turn, 1/2 Cuban →		Max Turn, 1/2 Cuban →		Max Turn →	
Burner 360 ↑		Burner 360 ↑		Burner 360 ↑	
Solo Rejoin to Wedge ↑		Solo Rejoin to Wedge ↑		Solo Rejoin to Wedge ↑	
Wedge BUP ⇐		Wedge BUP ⇐		Wedge BUP ⇐	
Wedge Roll ⇒		Wedge Roll ⇒		Wedge Flat Pass ⇒	
Wedge Loop ⇐		Wedge 360 ⇐		Wedge 360 ⇐	
Wedge Burst ↓		Wedge Burst ↓		Wedge Burst ↓	
Inverted (6) / Slow Roll (5) → or ←		Inverted (6) / Slow Roll (5) → or ←		Inverted (6) / Slow Roll (5) → or ←	
High Bomb Burst ⇒		Rapid Recovery ↑		Rapid Recovery ↑	
High Bomb Burst RJ ⇐		Thunderbird St-In		Thunderbird St-In	
Thunderbird Pitch ⇐		Solo St-In		Solo St-In	
KE (Top of jet) ←					

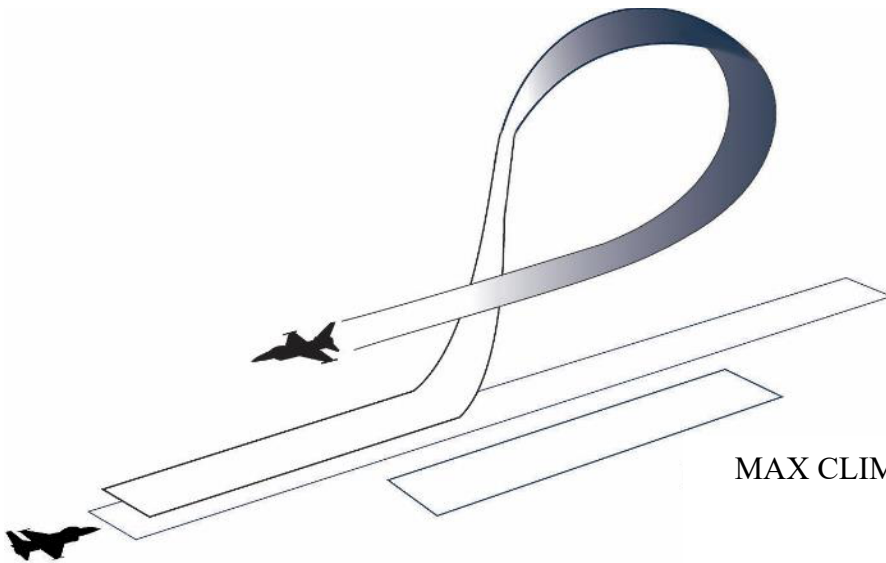
Thunderbird Demonstration Maneuvers

Entry A/S: 300-400kts
Exit A/S: 300-400kts
Entry Alt: N/A
Exit Alt: 300'



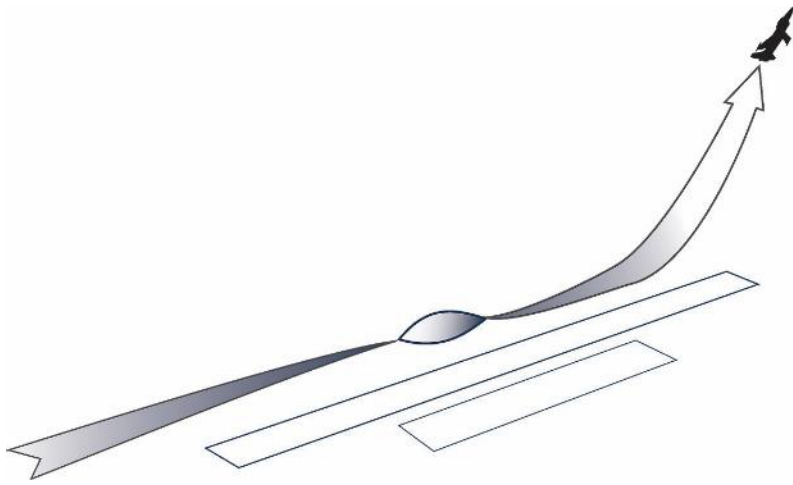
DIAMOND LOOP ON TAKEOFF
(Either Direction)

Entry A/S: 170kts
Exit A/S: .95M
Entry Alt: N/A
Exit Alt: 100'



MAX CLIMB WITH SPLIT-S ON TAKEOFF
(Either Direction)

Entry A/S: 250-350kts
Exit A/S: 250-300kts
Entry Alt: N/A
Exit Alt: 100'

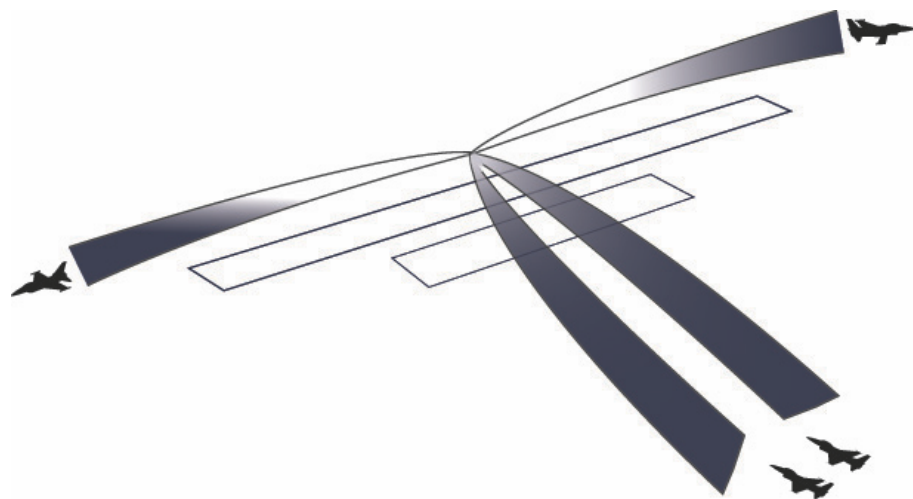


SOLO ROLL ON TAKEOFF
(Either Direction)

Entry A/S: 350-450kts
Exit A/S: 350-450kts
Entry Alt: 500'-150'
Exit Alt: 500'-150'

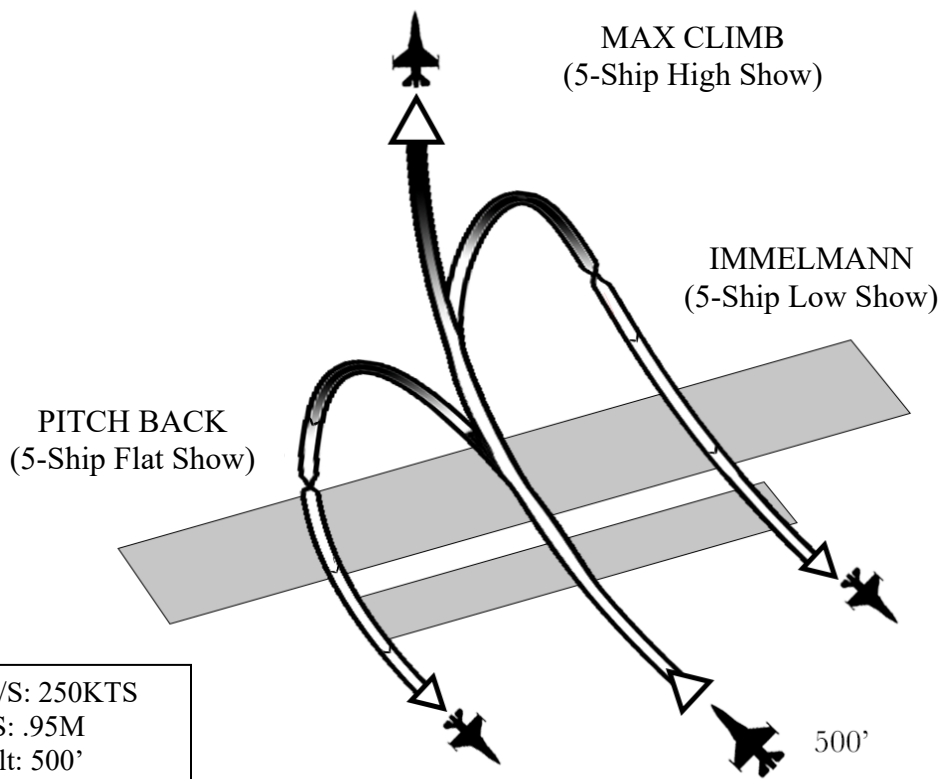


CLOVERLOOP OPENER



Entry A/S: 250-500kts
 Exit A/S: 250-500kts
 Entry Alt: 500'-100'
 Exit Alt: 500'-100'

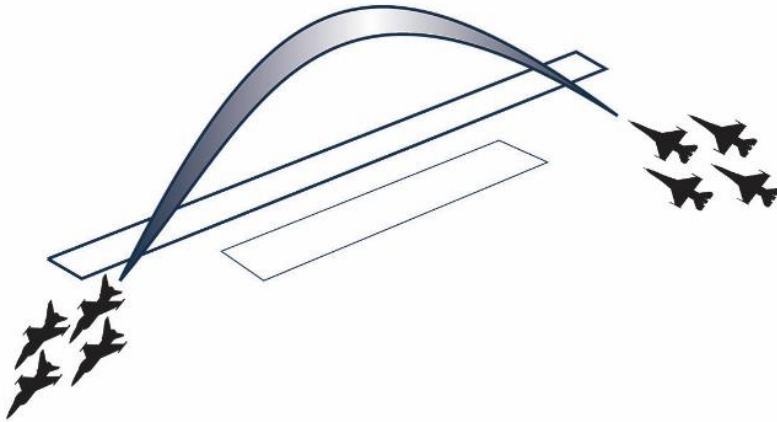
CROSS OVER BREAK



Entry A/S: 250kts
 Exit A/S: .95M
 Entry Alt: 500'
 Exit Alt: TFR ceiling

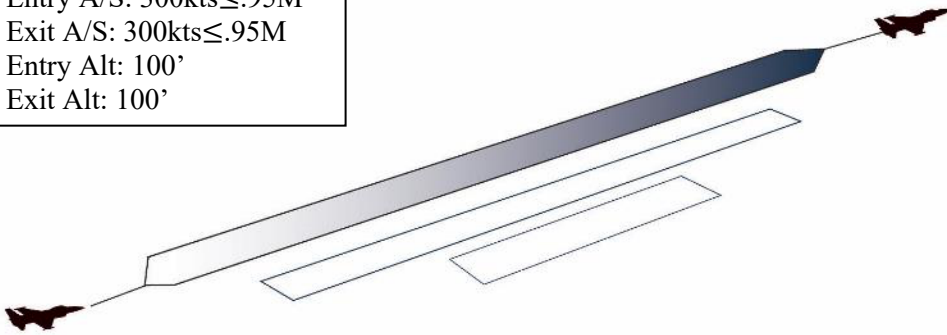
Entry A/S: 250KTS
 Exit A/S: .95M
 Entry Alt: 500'
 Exit Alt: 100'

Entry A/S: 250-350kts
Exit A/S: 250-350kts
Entry Alt: 500'-100'
Exit Alt: 500'-100'



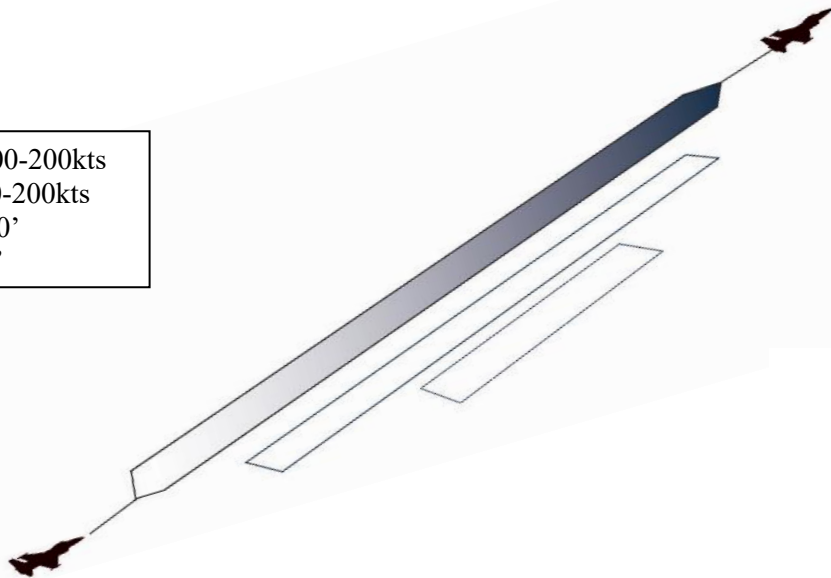
DIAMOND PASS IN REVIEW

Entry A/S: 300kts \leq .95M
Exit A/S: 300kts \leq .95M
Entry Alt: 100'
Exit Alt: 100'



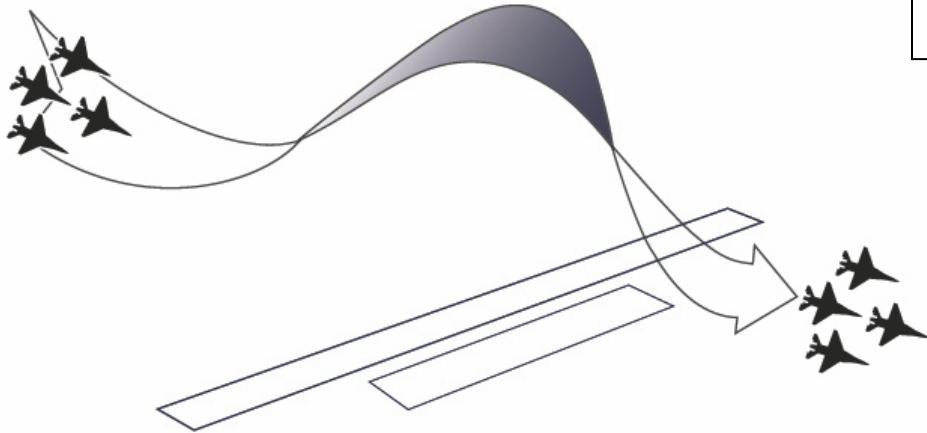
KNIFE EDGE

Entry A/S: 100-200kts
Exit A/S: 100-200kts
Entry Alt: 100'
Exit Alt: 100'



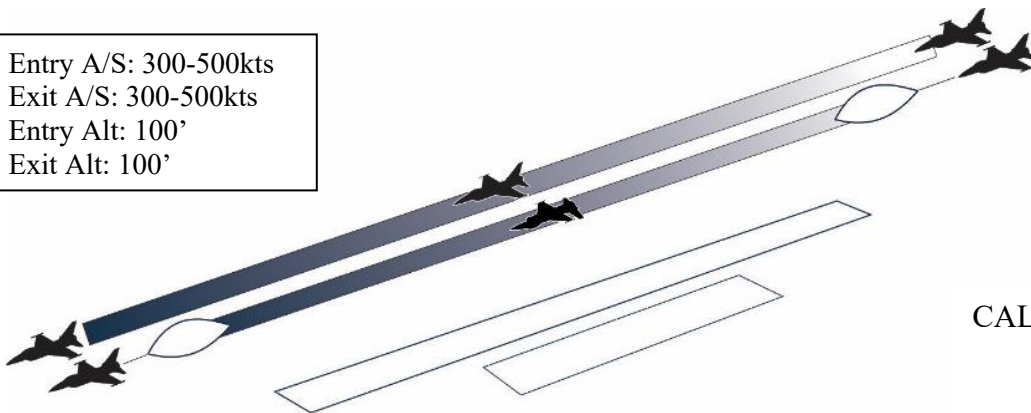
HIGH ALPHA
(Either Direction)

Entry A/S: 300-450kts
Exit A/S: 300-450kts
Entry Alt: 250'-150'
Exit Alt: 250'-150'

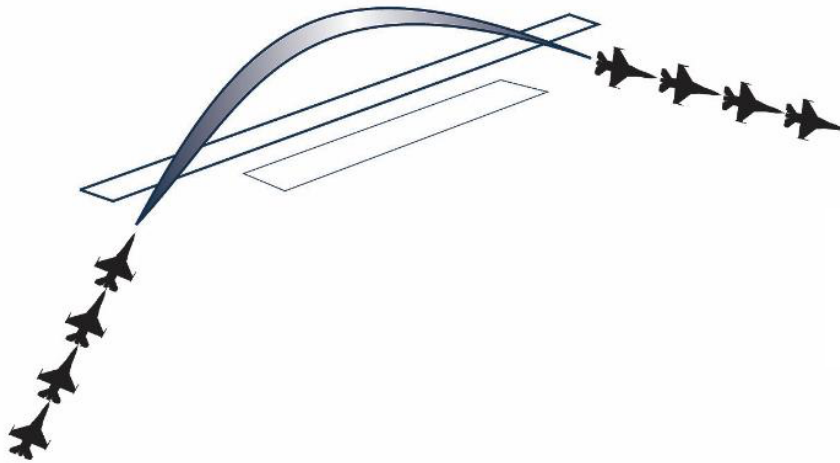


DIAMOND ROLL

Entry A/S: 300-500kts
Exit A/S: 300-500kts
Entry Alt: 100'
Exit Alt: 100'

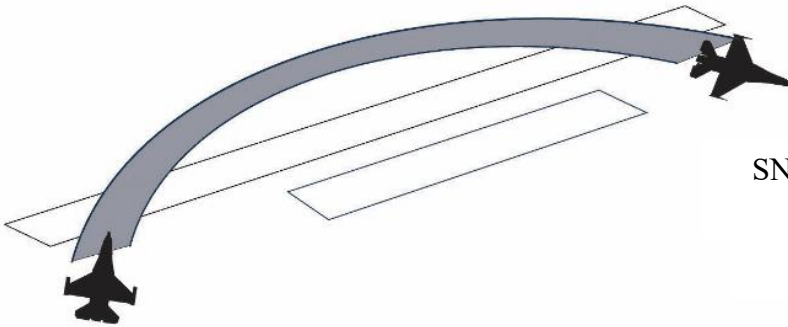


CALYPSO PASS



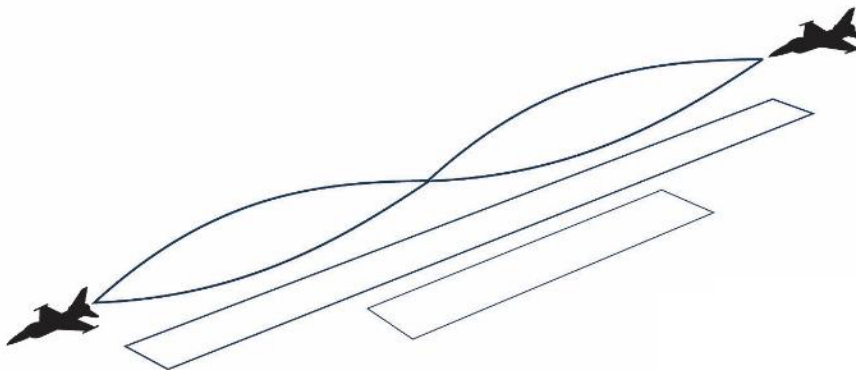
Entry A/S: 250-350kts
 Exit A/S: 250-350kts
 Entry Alt: 500'-150'
 Exit Alt: 500'-150'

ECHELON PASS IN REVIEW



Entry A/S: $.8M \leq .95M$
 Exit A/S: $.8M \leq .95M$
 Entry Alt: 100'
 Exit Alt: 100'

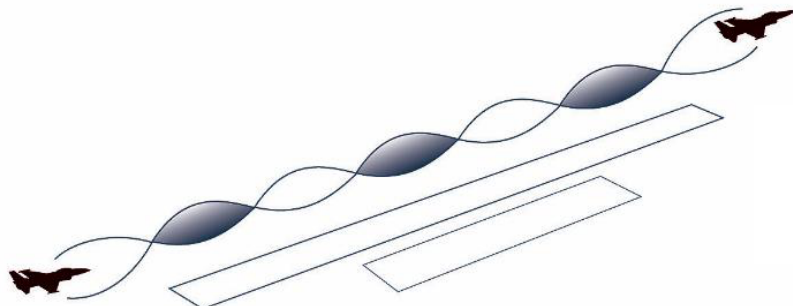
SNEAK PASS/AFTER BURNER ON
 (Either Direction)



Entry A/S: 300-550kts
 Exit A/S: 300-550kts
 Entry Alt: 100'
 Exit Alt: 100'

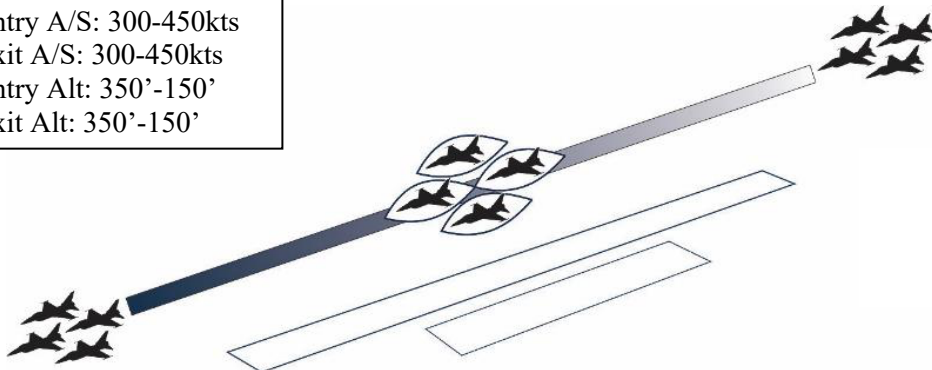
SLOW ROLL
 (Either Direction)

Entry A/S: 300-550kts
Exit A/S: 300-550kts
Entry Alt: 100'
Exit Alt: 100'



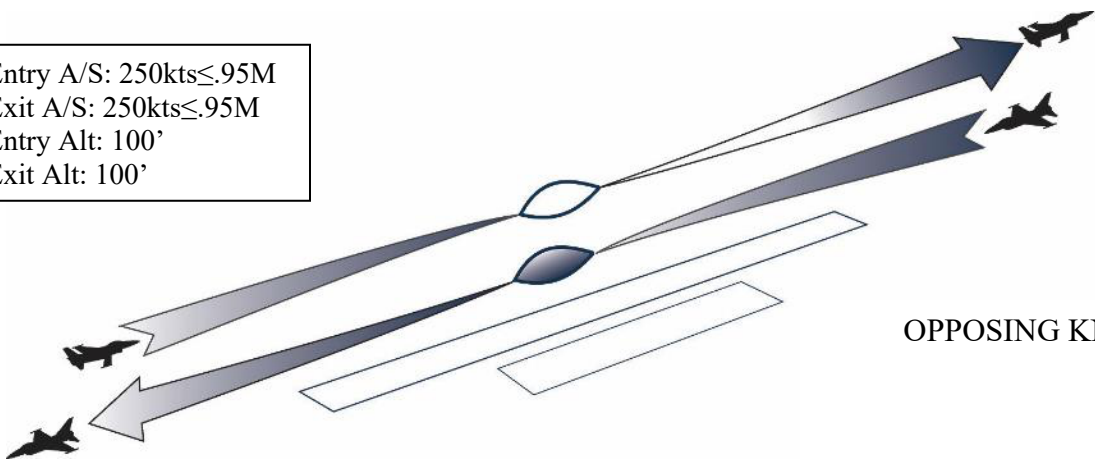
AILERON ROLLS
(Either Direction)

Entry A/S: 300-450kts
Exit A/S: 300-450kts
Entry Alt: 350'-150'
Exit Alt: 350'-150'



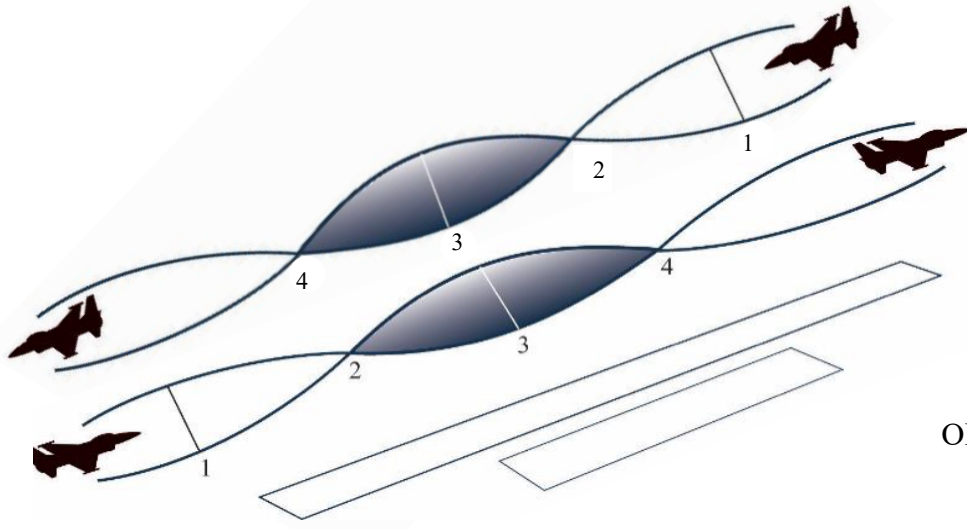
BON TON ROULLE

Entry A/S: 250kts ≤ 95M
Exit A/S: 250kts ≤ 95M
Entry Alt: 100'
Exit Alt: 100'



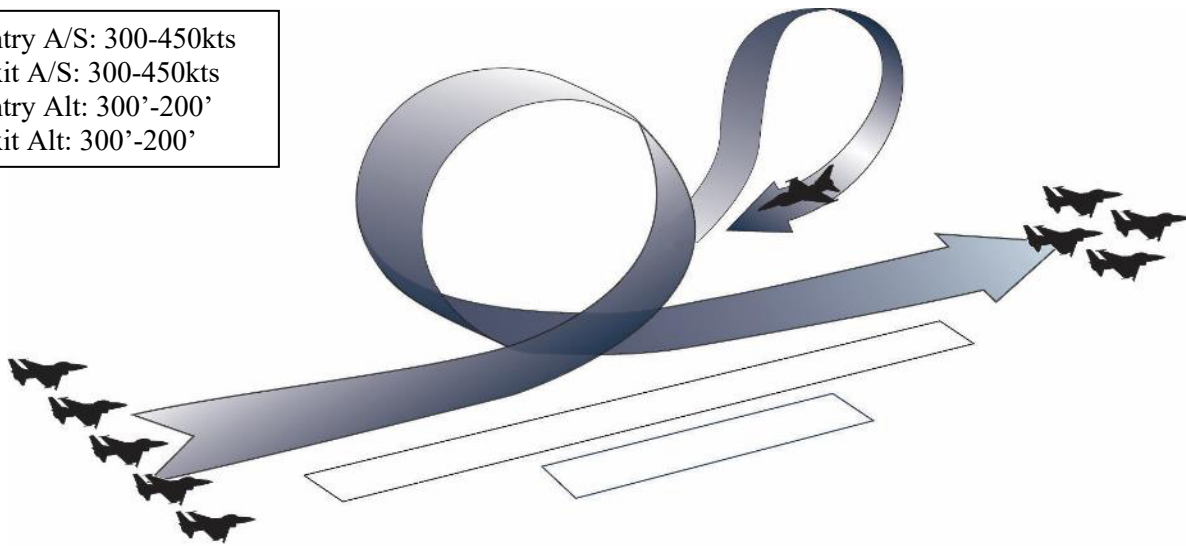
OPPOSING KNIFE EDGE

Entry A/S: 250kts ≤ 95M
Exit A/S: 250kts ≤ 95M
Entry Alt: 100'
Exit Alt: 100'



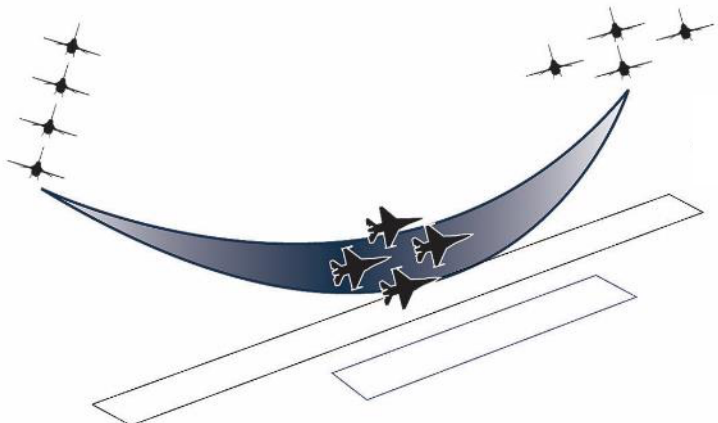
OPPOSING 4-POINT

Entry A/S: 300-450kts
Exit A/S: 300-450kts
Entry Alt: 300'-200'
Exit Alt: 300'-200'



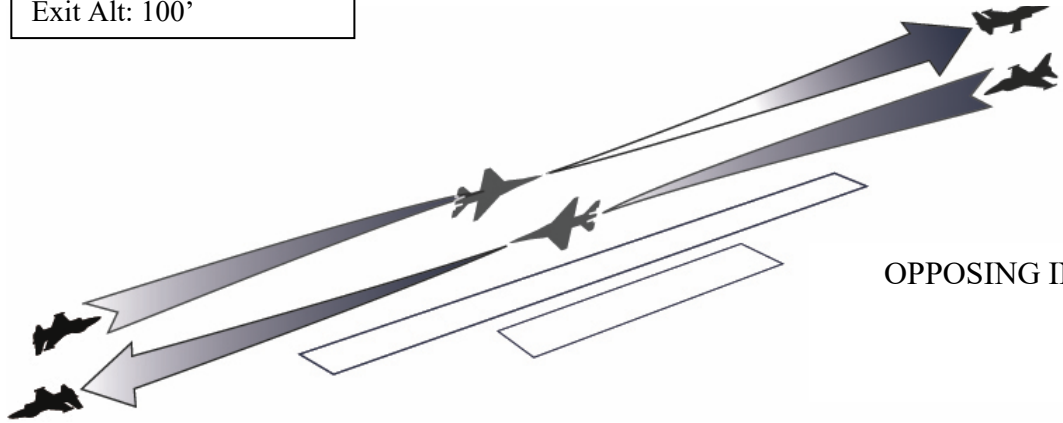
STINGER BREAK CROSS
(Rotate from Y-axis to X-axis)

Entry A/S: 300-450kts
Exit A/S: 300-450kts
Entry Alt: 250'-150'
Exit Alt: 250'-150'



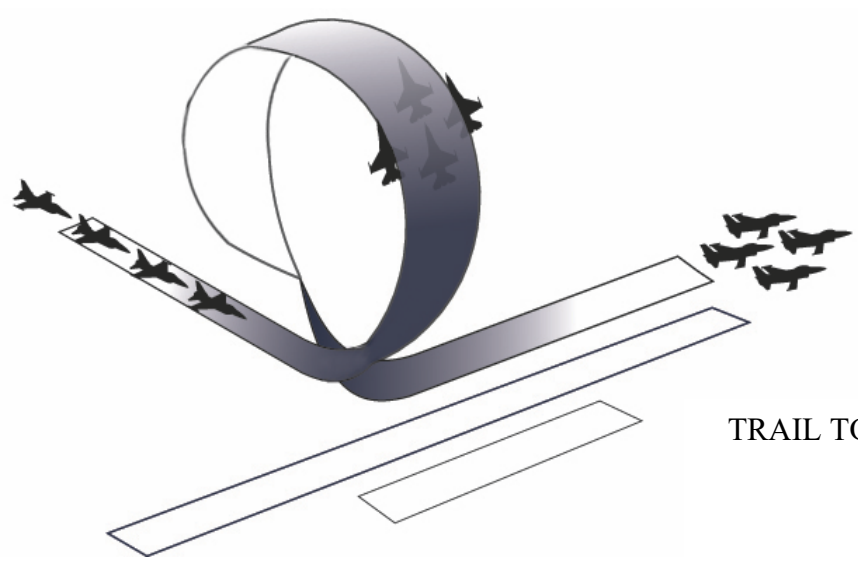
TRAIL TO DIAMOND BOTTOM UP PASS

Entry A/S: 250kts \leq .95M
Exit A/S: 250kts \leq .95M
Entry Alt: 100'
Exit Alt: 100'



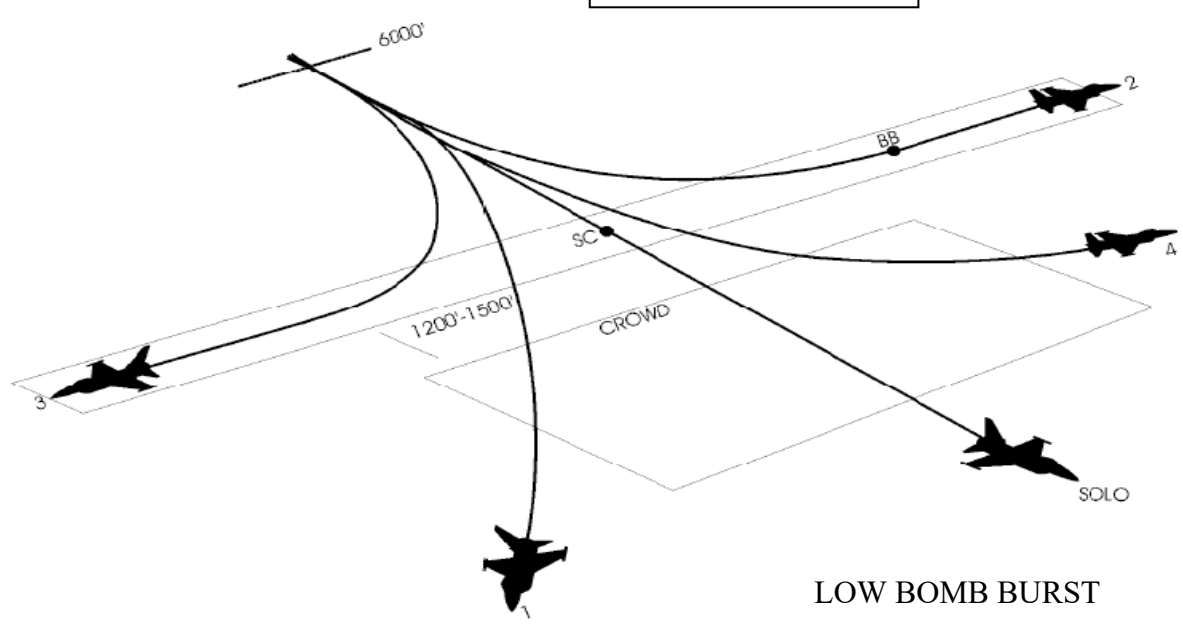
OPPOSING INVERTED PASS

Entry A/S: 350-450kts
Exit A/S: 350-450kts
Entry Alt: 300'-150'
Exit Alt: 300'-150'



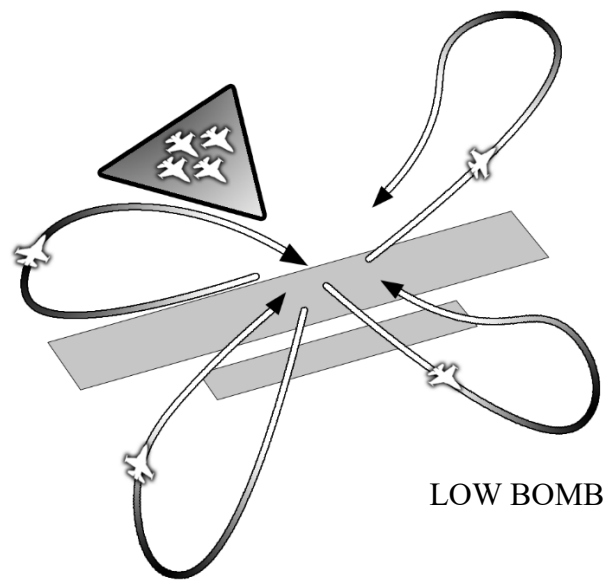
TRAIL TO DIAMOND CLOVERLOOP

Entry A/S: 300-450kts
Exit A/S: 300-450kts
Entry Alt: 500'-150'
Exit Alt: 500'-150'



LOW BOMB BURST

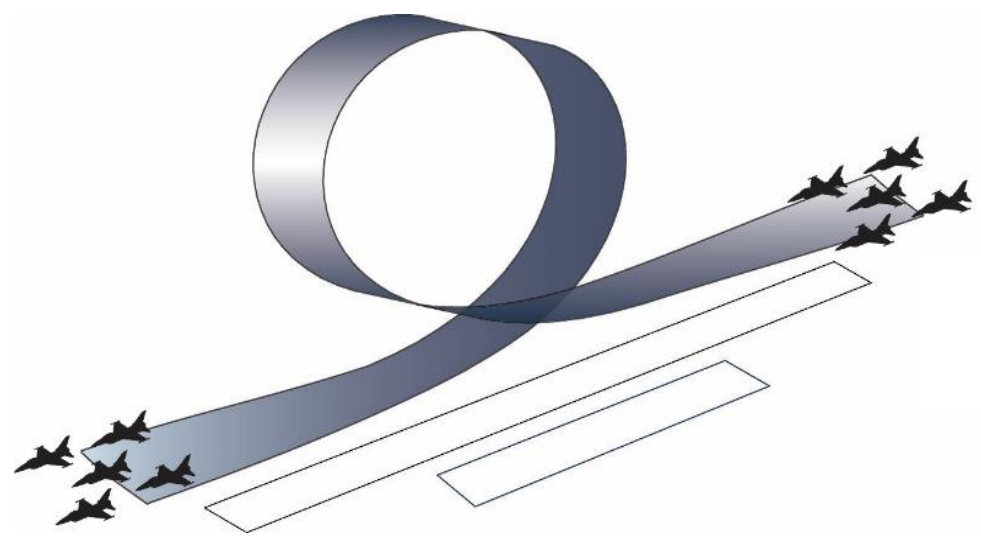
Entry A/S: 300-450kts
Exit A/S: 300-450kts
Entry Alt: 500'-150'
Exit Alt: 500'-150'



LOW BOMB BURST CROSS

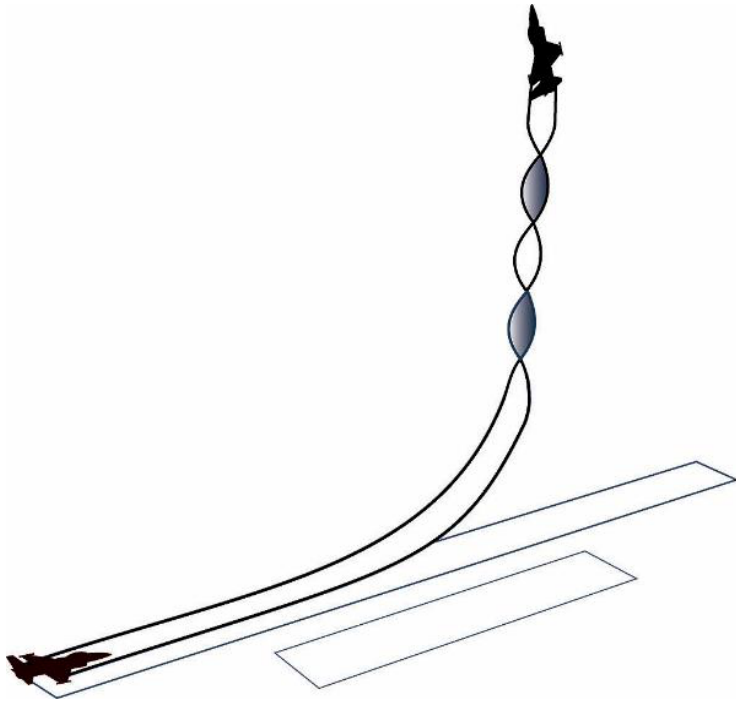
(Aircraft flying over the crowd will be at 500' minimum. #5 jet will be 500' over the crowd with entry/exit airspeeds of 300kts≤.95M)

Entry A/S: 300-450kts
Exit A/S: 300-450kts
Entry Alt: 300'-200'
Exit Alt: 300'-200'



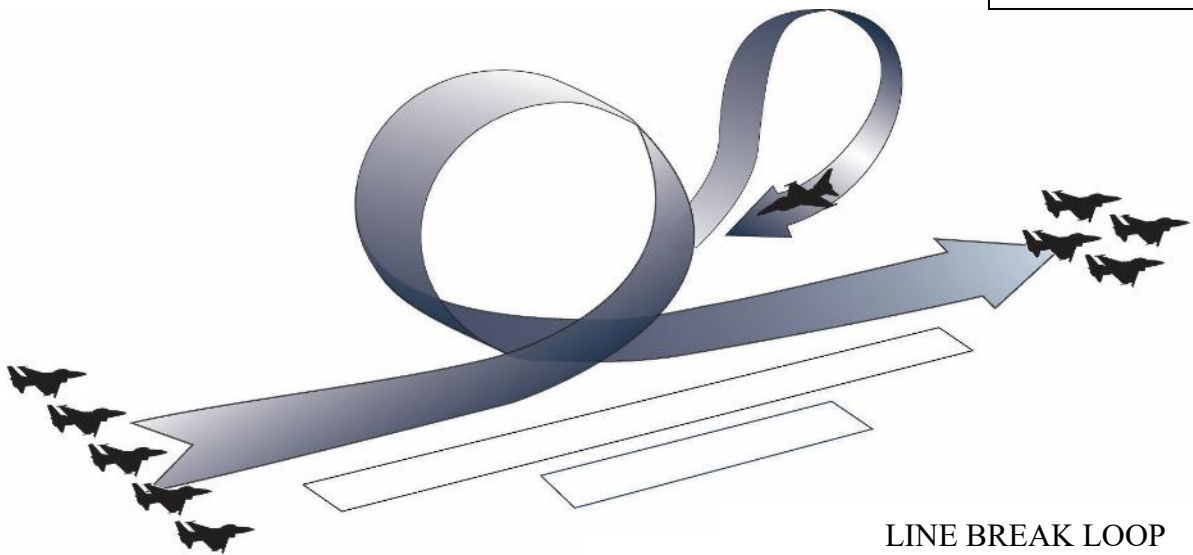
5-CARD LOOP

Entry A/S: 300kts≤.95M
Exit A/S: 300kts≤.95M
Entry Alt: 100'
Exit Alt: TFR ceiling



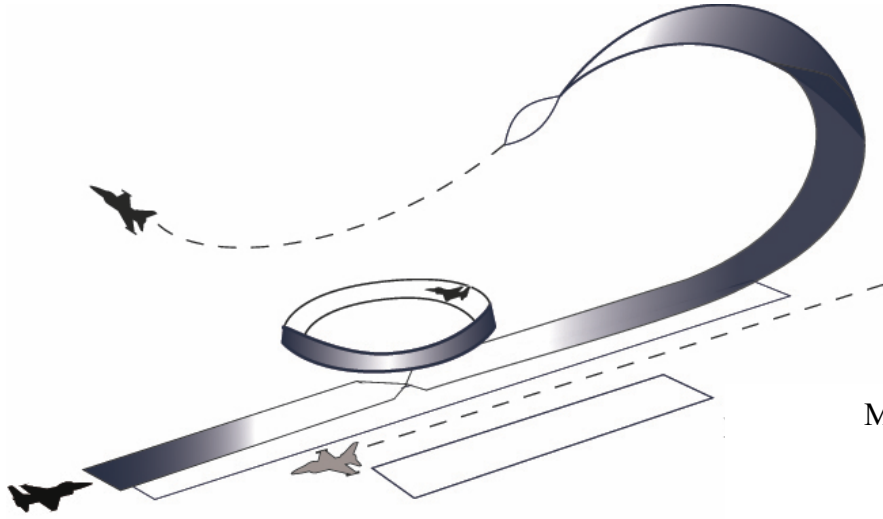
VERTICAL ROLLS

Entry A/S: 300-450kts
Exit A/S: 300-450kts
Entry Alt: 300'-200'
Exit Alt: 300'-200'



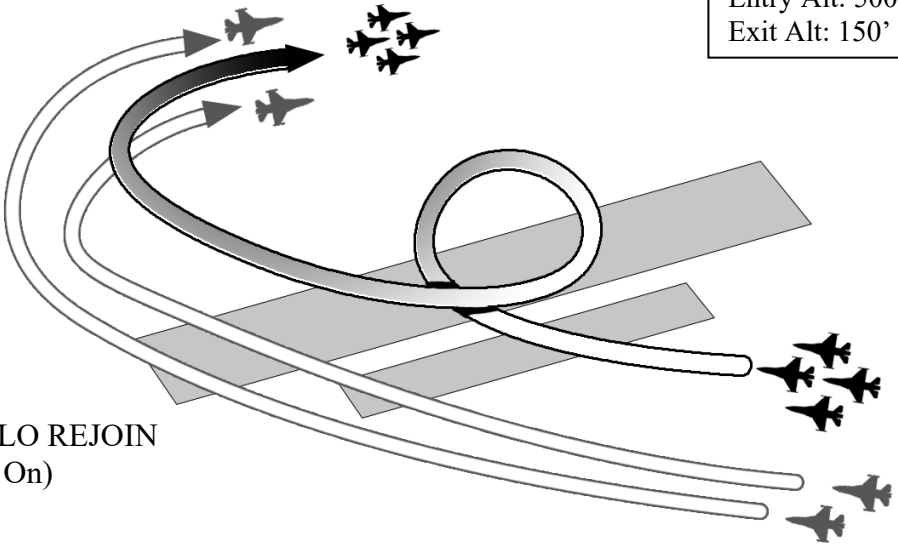
LINE BREAK LOOP

Entry A/S: 300-500kts
Exit A/S: 300-500kts
Entry Alt: 100'
Exit Alt: 100'



MAX TURN, 1/2 CUBAN

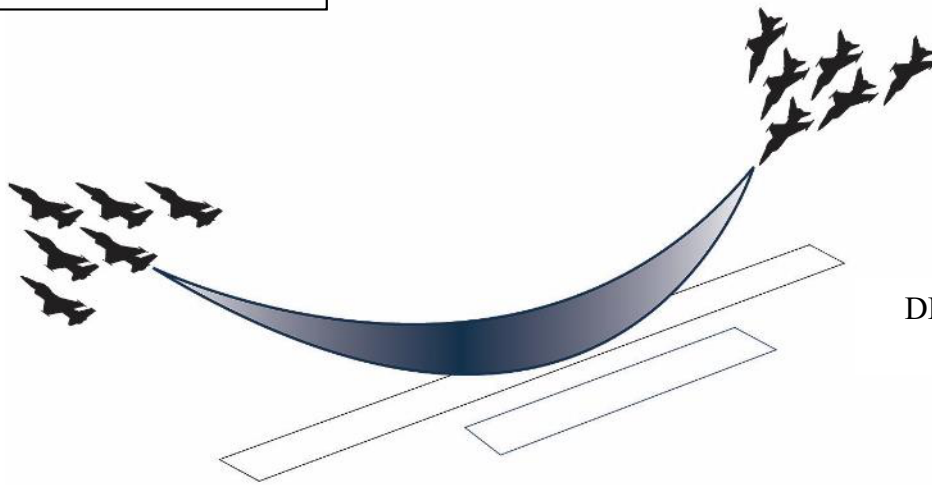
Entry A/S: 250-500kts
Exit A/S: 250-500kts
Entry Alt: 500'
Exit Alt: 150'



DIAMOND 360, SOLO REJOIN
(Afterburner On)

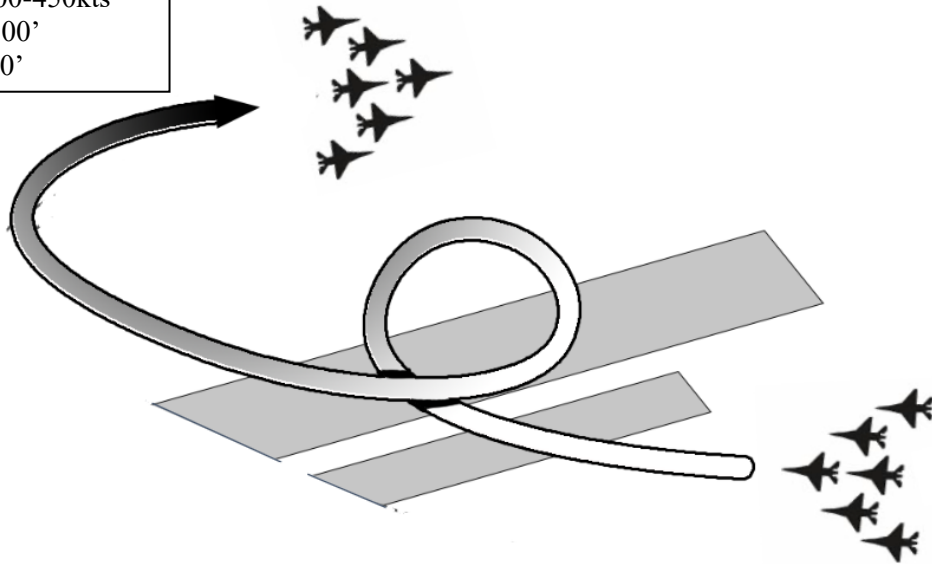
(Aircraft flying over the crowd will be at 500' minimum. The solos will be 500' over the crowd, descend no lower than 100' once past the crowd. Entry/exit airspeeds of 250-500kts.)

Entry A/S: 300-450kts
Exit A/S: 300-450kts
Entry Alt: 300'
Exit Alt: 200'

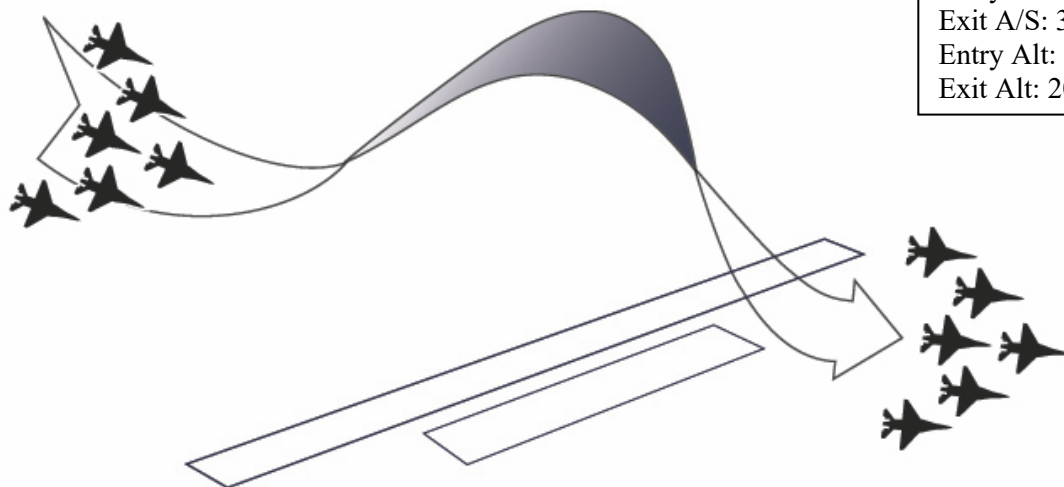


DELTA BOTTOM UP PASS

Entry A/S: 300-450kts
Exit A/S: 300-450kts
Entry Alt: 300'
Exit Alt: 200'

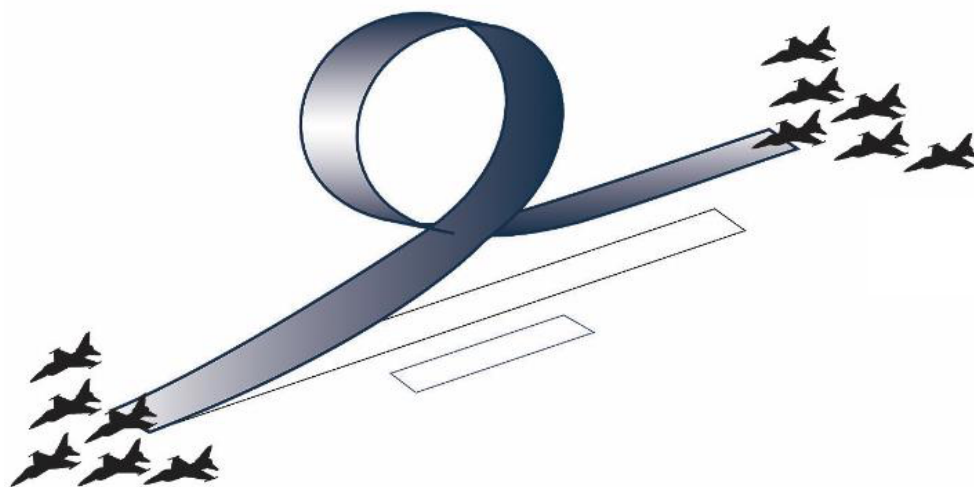


DELTA 360



Entry A/S: 300-450kts
Exit A/S: 300-450kts
Entry Alt: 300'
Exit Alt: 200'

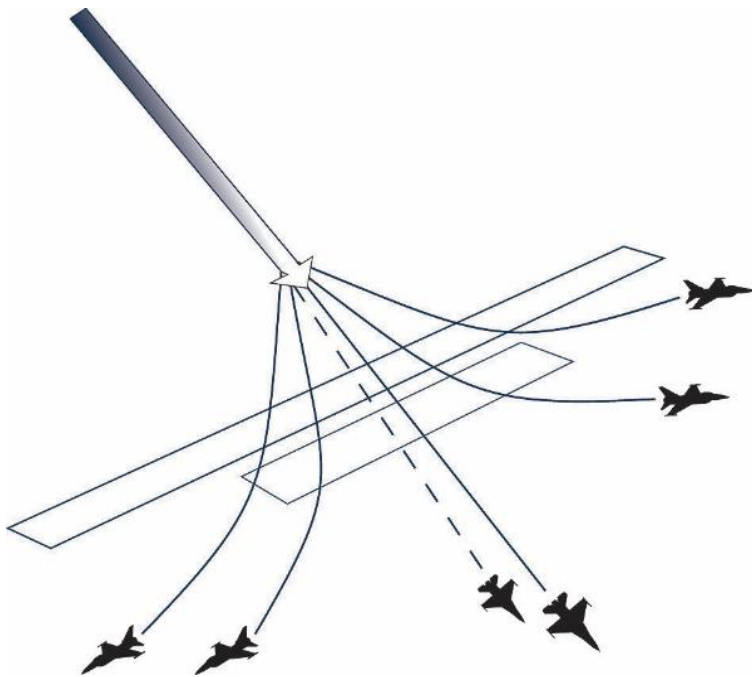
DELTA ROLL



Entry A/S: 300-450kts
Exit A/S: 300-450kts
Entry Alt: 300'
Exit Alt: 200'

DELTA LOOP

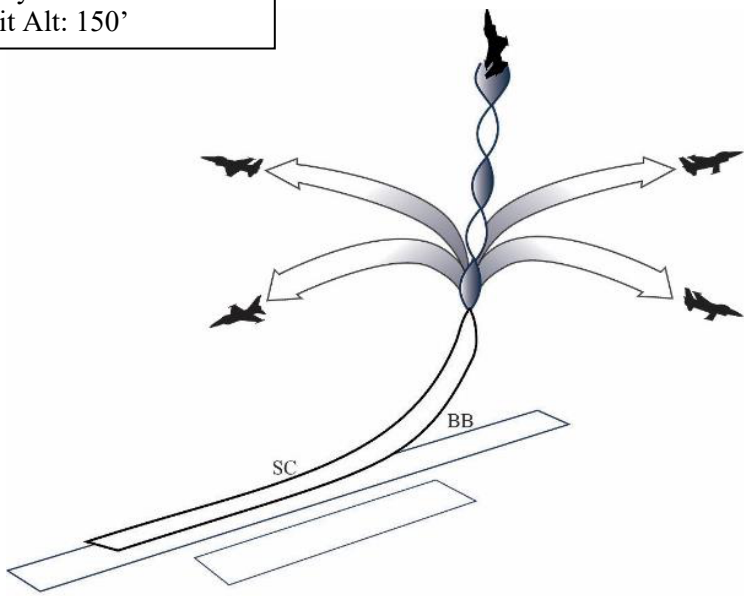
Entry A/S: 300-450kts
 Exit A/S: 300-450kts
 Entry Alt: 400'
 Exit Alt: 500'



DELTA BURST

(Aircraft flying over the crowd will be at 500' minimum)

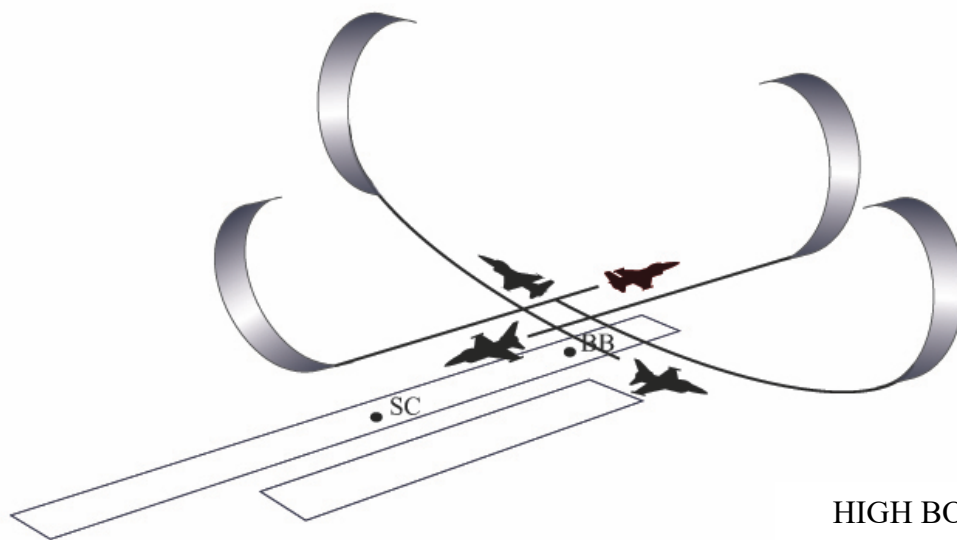
Entry A/S: 300-450kts
 Exit A/S: 300-450kts
 Entry Alt: 300'
 Exit Alt: 150'



HIGH BOMB BURST, SOLO HIT TO VERTICAL ROLLS

Legend
 SC show center
 BB bomb burst

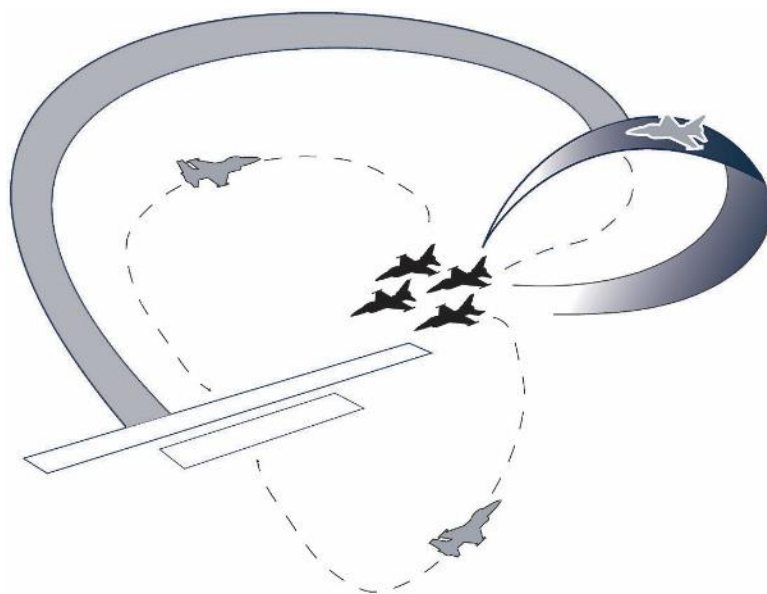
(The #5 jet will be 500' over the crowd and climb no higher than the TFR ceiling. Entry/exit airspeeds of 300kts ≤ .95M)



Entry A/S: 300-450kts
 Exit A/S: 300-450kts
 Entry Alt: 400'
 Exit Alt: 150'

HIGH BOMB BURST, CROSS

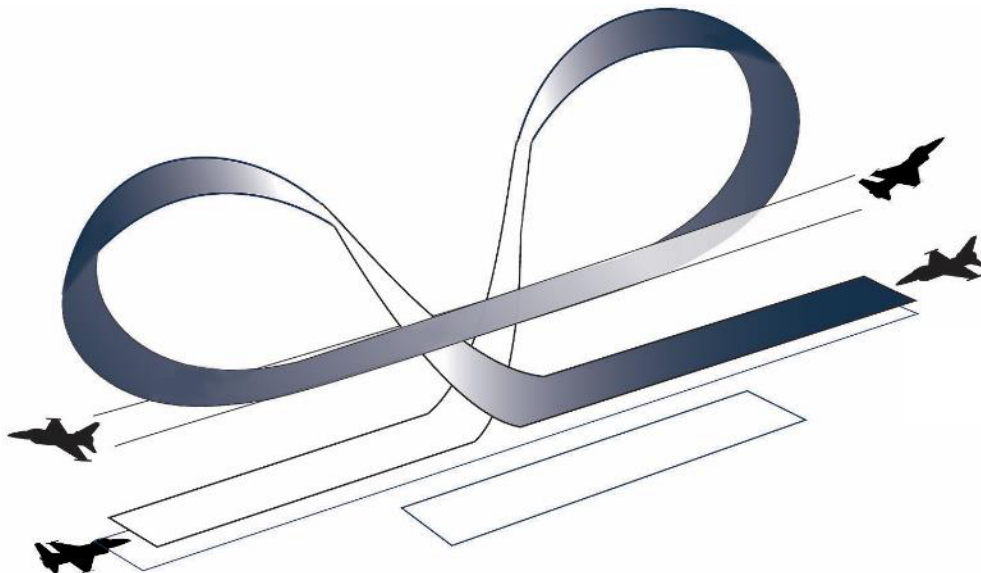
(The #5 jet will be 500' over the crowd and climb no higher than the TFR ceiling. Entry/exit airspeeds of 300kts ≤ .95M)



Entry A/S: 300-450kts
 Exit A/S: 300-450kts
 Entry Alt: 300'
 Exit Alt: 150'

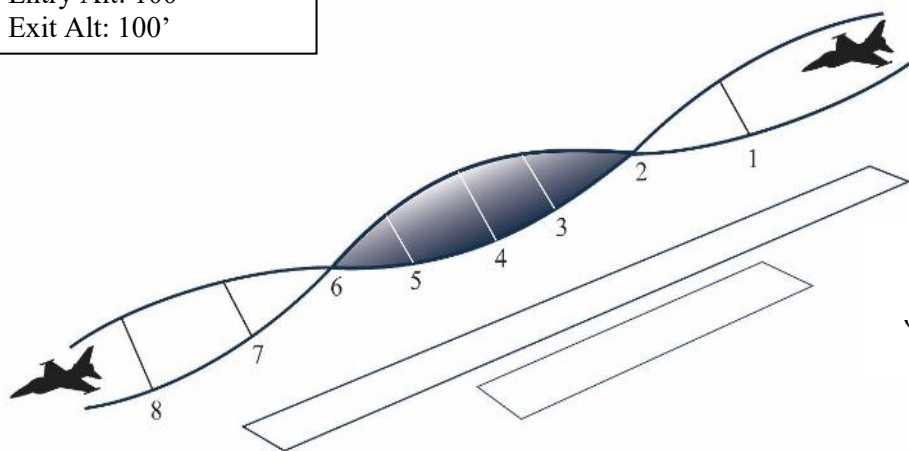
HIGH BOMB BURST, REJOIN

Entry A/S: 250kts≤.95M
Exit A/S: 250kts≤.95M
Entry Alt: 100'
Exit Alt: 100'

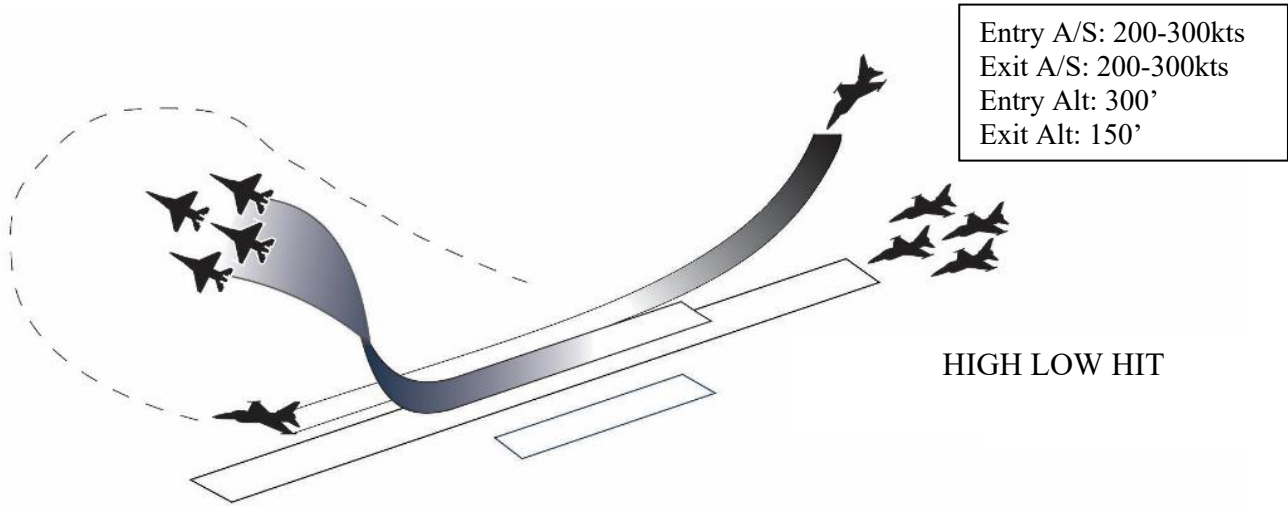


OPPOSING SPLIT-S

Entry A/S: 300-500kts
Exit A/S: 300-500kts
Entry Alt: 100'
Exit Alt: 100'



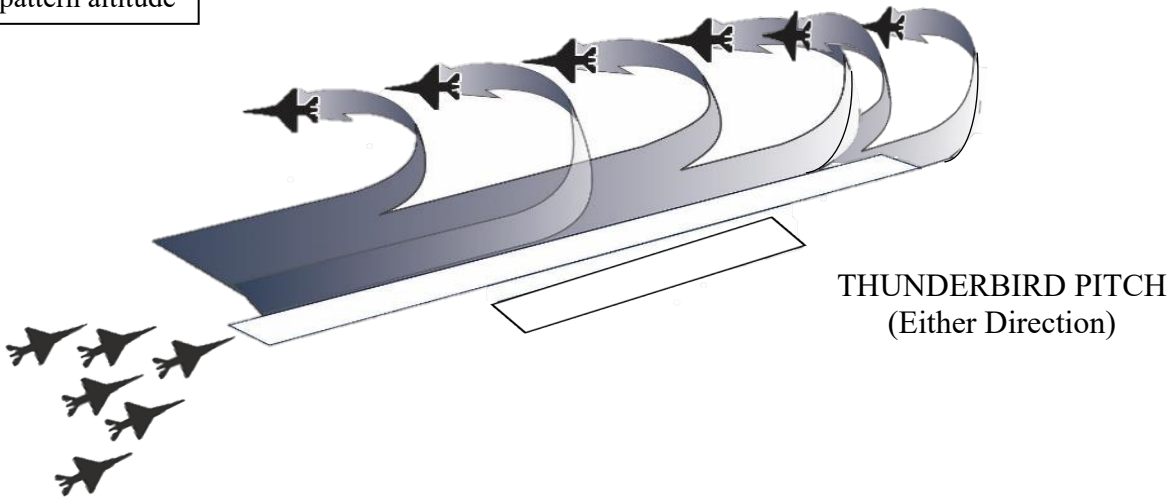
8-POINT ROLL
(Either Direction)



HIGH LOW HIT

(The #5 jet will fly between 300'-500' with entry/exit airspeeds of 250kts ≤ .95M. Post pass, solo executes Half Cuban then rejoins with Diamond.)

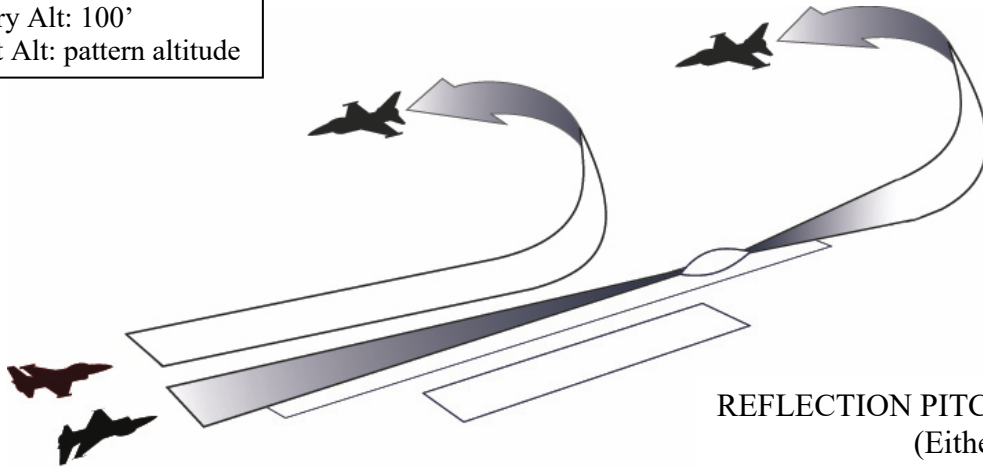
Entry A/S: 300-450kts
Exit A/S: 300-450kts
Entry Alt: 300'
Exit Alt: pattern altitude



THUNDERBIRD PITCH
(Either Direction)

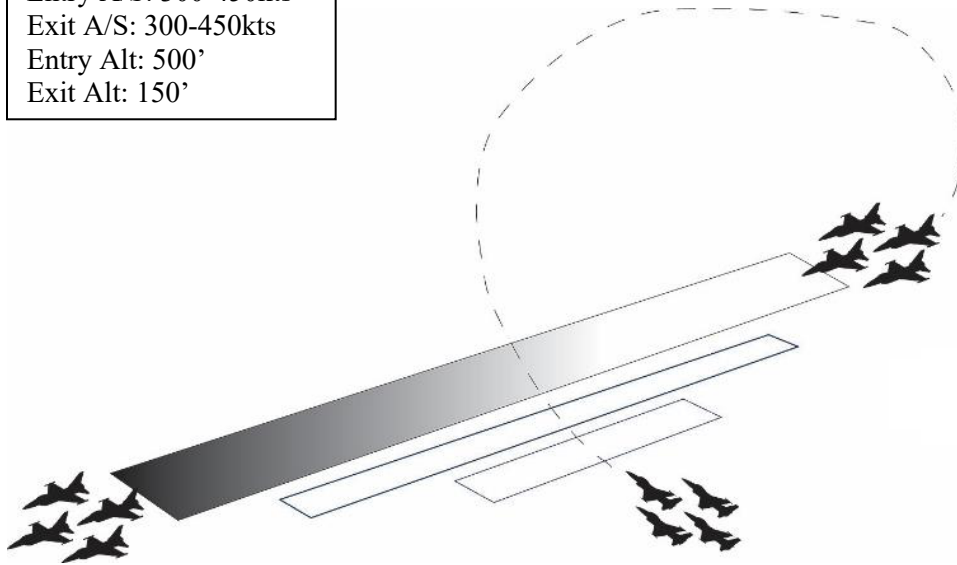
Entry A/S: 300-450kts
Exit A/S: 300-450kts
Entry Alt: 100'
Exit Alt: pattern altitude

Entry A/S: 300-500kts
Exit A/S: 300-500kts
Entry Alt: 100'
Exit Alt: 100'



REFLECTION PITCH/ REFLECTION PASS
(Either Direction)

Entry A/S: 300-450kts
Exit A/S: 300-450kts
Entry Alt: 500'
Exit Alt: 150'

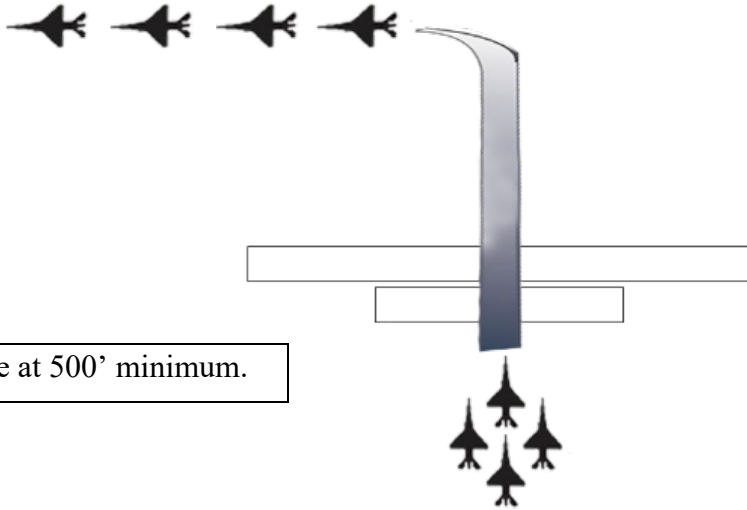


LOW OPENER

Entry A/S: 300-450kts
Exit A/S: 300-450kts
Entry Alt: 500'
Exit Alt: 150'

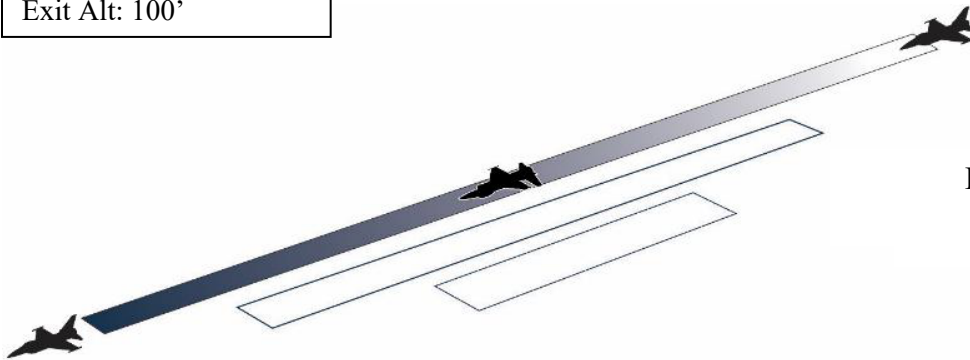
RAPID RECOVERY

Entry A/S: 300-450kts
Exit A/S: 300-450kts
Entry Alt: 500'
Exit Alt: 150'



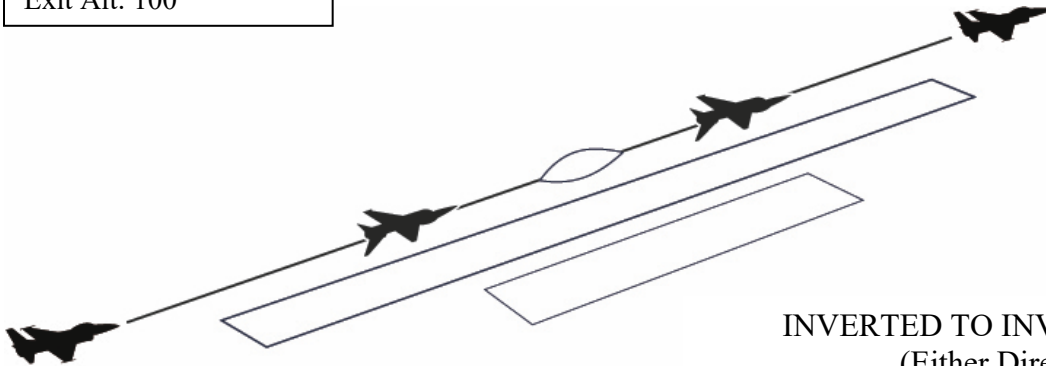
Aircraft flying over crowd will be at 500' minimum.

Entry A/S: 300-500kts
Exit A/S: 300-500kts
Entry Alt: 100'
Exit Alt: 100'



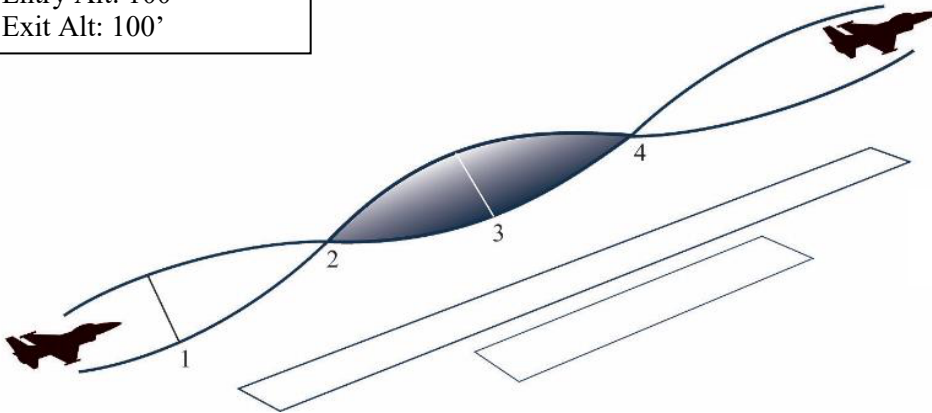
INVERTED PASS
(Either Direction)

Entry A/S: 300-500kts
Exit A/S: 300-500kts
Entry Alt: 100'
Exit Alt: 100'



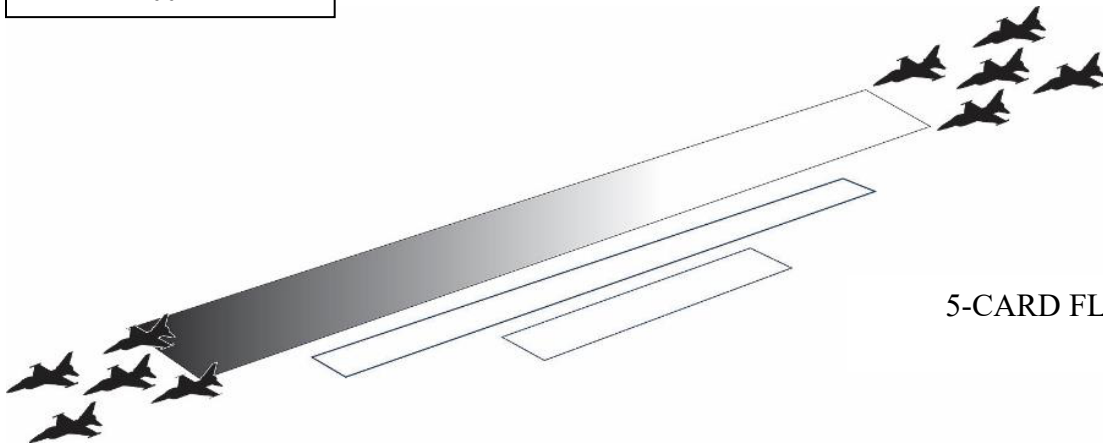
INVERTED TO INVERTED PASS
(Either Direction)

Entry A/S: 300-500kts
Exit A/S: 300-500kts
Entry Alt: 100'
Exit Alt: 100'



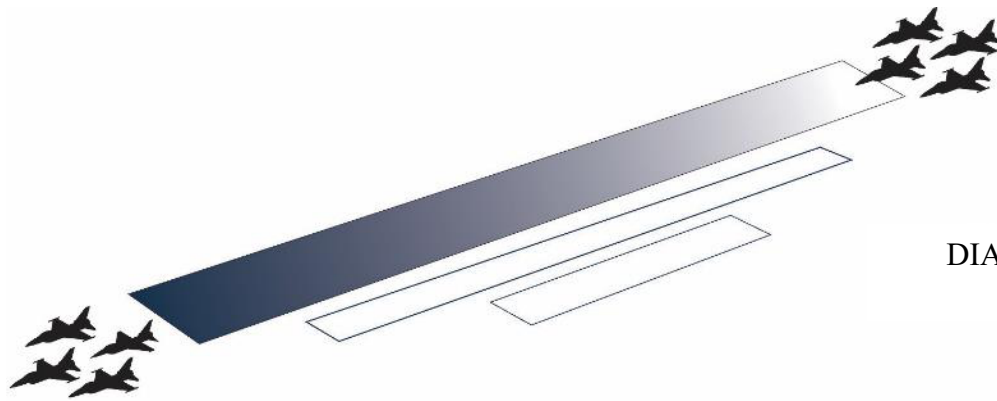
4-POINT ROLL
(Either Direction)

Entry A/S: 300-450kts
Exit A/S: 300-450kts
Entry Alt: 300'
Exit Alt: 200'



5-CARD FLAT PASS

Entry A/S: 300-450kts
Exit A/S: 300-450kts
Entry Alt: 300'
Exit Alt: 150'



DIAMOND FLAT PASS

Aerobatic Box

Typical show site airfield layout:

