



Flight Displays

The pilot's safety guide



All pictures are credited to VASCO MORA O



To ALL Display Pilots:

Flight display is a unique and exhilarating way of showcasing airplanes, flight skills and aviation in general. Executing a captivating aerial performance that will be remembered for all the good reasons demands your exceptional piloting skills but also your unwavering commitment to safety: of your aircraft, yourself and your audience! This short leaflet will guide you as a general checklist to deliver a successful and truly memorable display.

Further reading and deep dive is recommended in:

[CAP 403: Flying Displays and Special Events: Safety and Administrative Requirements and Guidance | Civil Aviation Authority \(caa.co.uk\)](#)

[Flying Display Pilot Authorisation and Evaluation: Requirements and Guidance Edition 5 \(caa.co.uk\)](#)

SAFETY CHECK



CHECK 1

Meticulous Planning: The Foundation of Success

Crafting a captivating display routine is an art form, demanding not just technical mastery but also a keen understanding of audience engagement and safety considerations. To elevate your display from good to unforgettable, collaboration is key. Constructive and critical comments from an experienced display pilot, with whom you have a good rapport, mutual trust and respect, will sharpen your display planning and work-up.

Leave nothing to

chance: Plan your route meticulously, accounting for fuel requirements, potential diversions, relevant frequencies, and airspace restrictions. Obtain detailed maps and charts of the display venue.

Detailed Preparation:

Obtain detailed maps and charts of the display venue.

Know Your Display Area:

Precisely identify the crowd line, designated display area, and restricted zones. Review NOTAMS and rehearse timings for a seamless display.

Display Design: Craft a captivating sequence that prioritises safety while enthraling the audience. Ensure manoeuvres are well within your capabilities and the aircraft's limitations while effectively showcasing its agility and aesthetics.

Rehearsal is Key: Practice your display extensively in a controlled environment well above the designated show altitude. Develop “escape manoeuvres” to address unexpected situations.

CHECK 1

Protect the Wider Public:

Identify and mitigate risks for secondary spectators (those congregating outside designated display areas) and third-party spectators (the general public on roads or in congested areas) to ensure the same level of protection is afforded to everyone.

Aircraft Knowledge is

Paramount: Blindly know the intricacies of your aircraft, its capabilities, and limitations.





CHECK 2

Pilot Qualification and Fitness

The road to becoming a successful display pilot goes beyond technical proficiency. It demands a well-rounded approach to fitness, encompassing both physical and mental well-being.

Physical and Mental

Fitness: Maintaining a good level of physical fitness is crucial. Are you well-rested before your flight, free from medication or stress, and physically ready? A clear and focused mind is paramount to manage the demands of your performance.

Proficiency & Currency:

Have no doubts that you, like your aircraft, meet all display authorisation requirements and that your pilot license, medical certificate, and display rating (if necessary) are current. Experience is crucial – tailor your display to your aircraft and proficiency level.

CHECK 3

Your Aircraft

Display flying is more demanding than everyday flying. You will push the limits of your own skills and the aircraft's capabilities to create a captivating performance. Therefore, even a minor technical issue can escalate into a catastrophic situation. A meticulous pre-flight inspection and the absolute certainty of airworthiness become the foundation for a safe and successful display.

Taking Flight: Maintaining Focus Throughout

Aircraft Preparation:

Conduct a meticulous pre-flight inspection, ensure a clear windscreen and secure controls.

Double-Check Everything:

Verify fuel levels, confirm completion of pre-flight checks, and mentally rehearse your sequence one last time.

Functional Test: Perform a brief functional flight check at a safe altitude to confirm aircraft performance and handling characteristics.



CHECK 4

enVironment

Real-World Considerations:

Be prepared to adapt your display routine based on weather conditions. Understand how wind, gusts, visibility and cloud cover may impact your flight path and safety clearances. Practice displays in varying weather to develop adaptability.

Density altitude matters:

Remember that high density altitudes caused by a hot day or high-altitude aerodrome will adversely affect aircraft and engine performance, even in high performance aircraft. High altitude or high temperature or high humidity is the invisible factor that can significantly impact your aircraft's performance.



CHECK 5

Sharpening Your Execution

Before taking flight, successful display pilots engage in a crucial ritual – mental rehearsal. This 10–15-minute period serves two purposes: ensuring complete pre-flight checks and performing a silent visualisation of the entire display sequence. This not only sharpens focus and builds confidence but also prepares you to adapt to the ever-changing conditions, ensuring a smooth, safe, and thrilling display.

Pre-Takeoff Vigilance:

Avoid commencing your display immediately after take-off. Use this time to become acclimated and conduct essential aircraft checks.

Energy Management:

Establish clear “safety gates” - minimum speed and altitude thresholds for critical manoeuvres. Practice “dump elements” to gracefully exit a manoeuvre if energy levels deviate from ideal. Ensure these escape paths and “dump elements” lead away from not only the primary crowd line but also known congested areas or secondary spectator gatherings.

SAFETY CHECK

Height above Ground:

check your altitude/height at the peak of manoeuvres (loops, stall turns) for a quick energy management check. A lower-than-expected height might signal insufficient energy to complete a later manoeuvre, allowing for early adjustments or safe termination.

Adapting to the Elements:

Practice displays in varying weather conditions. Be prepared to modify your routine or even abort if necessary for safety reasons.

CHECK 5



SAFETY CHECK

CHECK 6



Commanding your Display

Display flying is a delicate dance between captivating manoeuvres and unwavering safety. While you undoubtedly have memorised your display, a sequence card serves as a valuable backup. A quick glance can refresh memory, ensuring smooth transitions and precise execution of each manoeuvre. This allows you to anticipate every next move and maintain focus and command throughout the routine.

Situational Awareness is

Paramount: Maintain constant vigilance for other aircraft both within and outside the designated display area. Extend this vigilance to the ground; monitor secondary spectators (those gathering outside designated display areas) and third-party spectators (general public undertaking their day-to-day activity i.e. on roads, congested areas).

Clear Communication:

In case of unforeseen circumstances, utilise appropriate emergency phraseology (Mayday or Pan-Pan, “Knock -it off”) for clear and concise communication. Prioritise safety above all – aborting a display is a crucial decision, never a failure.

Adaptability Under Pressure:

Be prepared for last-minute changes due to unforeseen factors. Never attempt manoeuvres beyond your skill level.



SAFETY CHECK



CHECK 7

Reflecting on your Performance

The cheers and applause from the crowd are a well-deserved reward for a thrilling display. However, your professionalism as display pilot extends far beyond the captivating manoeuvres themselves. Actively seeking ways to improve are the hallmarks of a true aviator. Remember, the display truly ends when you're safely out of the aircraft, and the valuable lessons learned pave the way for even more awe-inspiring performances in the future.

Maintain Focus Until Shutdown:

A truly professional display encompasses the entire operation, from engine start to safe shutdown after landing. Don't let the exhilaration of the performance affect your focus.

Embrace Feedback for Improvement:

Seek constructive feedback from qualified observers. Analyse your performance and identify areas for continuous improvement.

Always Remember and Bear in Mind

A successful display is one that is executed flawlessly, captivating the audience while guaranteeing the safe return of you and your aircraft. True mastery is defined by the protection of all people—your audience, secondary spectators, and the general public undertaking their daily activities nearby.

Embrace the challenge, prioritise safety above all else, and showcase your aerial mastery with confidence.

Now take flight and inspire!





Regulatory Framework

There are no pan European rules for display flying. Flight display flying may be conducted under Part-NCO (non-commercial operations) and SERA (Rules of the Air), but many member states do have tailored national regulations.

SERA – Rules of the Air:

You must comply with minimum heights, right-of-way and the requirement to avoid endangering persons or property.

A specific authorisation or permit may be required to waive minimum height limitations for display flying.

Part-NCO Subpart E – Specific Requirements:

Provides additional operational requirements for certain types of operations. Display flying requires a structured approach to risk, limitations and operational control.

National regulations:

Many Member States have specific rules for flight displays, including pilot authorisation, approval of display programmes and defined safety distances. These may be more restrictive.