Avoiding airspace infringements using
Threat & Error Management

Airmanship is the art of applying your skill and knowledge to flying. A practical and easy way of doing this is by using Threat and Error Management (TEM) to manage ALL hazards likely to be encountered on the ground and in the air. In this card we look at how TEM can be used to prevent airspace infringements.

TEM is the practice of thinking ahead to predict/identify and avoid errors and threats and manage any that occur. Understanding TEM will enable a pilot to think and plan, in advance, for the eventualities that can lead to an airspace infringement. By spending time on the ground, pre-flight, to consider these factors you will be better prepared for many of the things that can wrong in the air.

THREAT ➤ **AIRSPACE INFRINGEMENT** **ERROR** ➤

What is a THREAT?

Events or things that occur outside your control which require your attention if safety is to be maintained Threats are beyond the influence of you as the pilot and they increase the complexity of the flight. Examples of Threats that may lead to airspace infringements include:

- Distraction caused by task or passengers
- Airspace including NOTAM'd activity
- Weather inc. thermal activity
- Fatigue / Stress
- In-flight malfunctions
- Lack of recent experience (skill fade) or Complacency

What is an ERROR?

Actions or inactions that lead to the unwanted or unsafe deviation from the plan, as with threats. Errors have the potential to reduce safety margins which could lead to additional errors or an airspace infringement. Examples of Errors that may lead to airspace infringements include:

- Navigation errors leading to vertical, or lateral deviations
- Mis-interpretation of chart
- Incorrect altimeter setting
- Missed calls / incorrect phraseology
- Mis-interpretation of instructions or clearances
- Unsynchronised Direction Indicator

How do I MANAGE it?

Pilots must, in the interest of safety and normal pre-flight and in-flight activities, manage threats and errors to prevent airspace infringements. Examples of management techniques include full and comprehensive planning and adequate briefing, training, managing distractions and applying all available tools to prevent airspace infringements.

See over for more on how you can avoid INFRINGEMENTS

Pre-Flight

FAILING TO PLAN AMOUNTS TO PLANNING TO FAIL

Spend time on the ground anticipating possible threats associated with the flight. Detailed planning will provide the opportunity to develop mitigations (for example, action in the event of weather changes, the actual winds being different from the forecast).

Complete a full **NOTAM** brief and understand what each NOTAM is telling you including the activity times if the NOTAM covers multiple days. If you are unsure, contact the sponsor; many NOTAM include a telephone contact number for further information. Understand what each NOTAM series refers to and the risk associated with it. NATS offers a free facility for NOTAM briefing at www.nats-uk.ead-it.com

Using a narrow route brief rather than an area brief will make the number of NOTAM more manageable. If you use a Moving Map to carry out your NOTAM brief, make sure you understand how and why activities are depicted as well as checking that current data has been downloaded.

Pay particular attention to airspace structures and their boundaries in relation to the intended route and altitude and refer to the UK AIP and the Skyway Code (www.caa.co.uk/skywaycode) to ensure airspace requirements (for example, for ATZ, TMZ and RMZ) are fully understood. By thinking in 3-dimensions you will be able to plan climb and descent points; building into your plan the 'Take 2' and altimeter setting guidance, and you will reduce the probability of making a vertical infringement.

Carry out a thorough meteorology self-brief and ensure that you have the complete forecast weather picture for the whole of your intended route and alternates as well as areas of turbulence and thermal activity. Check the Metforms 214 and 215 as part of your pre-flight briefing.

In-Flight

Use a **Moving Map** to increase situational awareness and obtain timely airspace alerts. If you are carrying out instruction or examination duties, the probability for distraction is greater. In recent analysis instructors were involved around 1 in 6 airspace infringements; the majority were not using a Moving Map and were either distracted or failed to appreciate their proximity to controlled airspace.

When able, **Take 2** by remaining 2nm laterally or 200 feet vertically clear of the edge/base of controlled airspace to reduce the consequences of turbulence, distraction or external influences.

Obtain an **Air Traffic Service** or use a **Frequency Monitoring Code** (also known as a Listening Squawk) rather than squawking 7000/2000 and operating autonomously. By doing so, any inadvertent airspace infringement can be resolved in a timely manner thereby reducing the safety risk to other air traffic inside notified airspace.

Self-brief (including passengers or students) planned procedures prior to commencing each significant part of the flight (for example, turning points and the approach to an airfield). Use all available briefing material to increase situational awareness before you fly; the Airspace and Safety Initiative website (airspacesafety.com) has a great deal of resource and guidance that will help identify Threats and possible Errors.

Prioritise tasks and manage workload to avoid being **overloaded or distracted.** Using checklists and briefing passengers or students of impending cockpit tasks and increases in workload will manage the risk of errors through distraction

Post-Flight

Reconsider what threats were encountered and what errors were made during the flight. Think about how well these were managed and what could have been done differently to improve the management of similar threats and errors during future flights.