

AIRSPACE CO-ORDINATION NOTICE

Safety and Airspace Regulation Group



ACN Reference:	Version:	Date:	Date of Original
2023-08-0108	1.0	02/08/2023	24/07/2023

RAF SHAWBURY - RADAR CALIBRATION (WIDE AREA MULTILATERATION (WAM))

CAT Z

Subject to NOTAM: No

Date(s) of activity/Validity: Times (ALL TIMES UTC)

1 Aug 23 – 1 Aug 24 inclusive 2000 - 0400

Vertical Limits: Allocated Mode 3A (SSR):

5,000ft – 8,000ft AMSL 0024

Aircraft Details: NDS Approved:

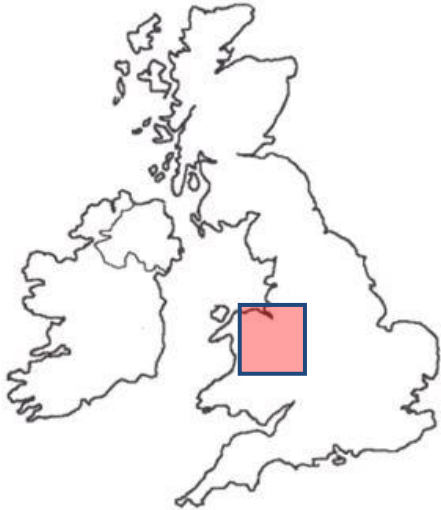
B200 / DA42 Not Applicable.

Event Sponsor(s): Aircraft Operator(s):

Anthony Tyrer C/O Thales Flight Inspection Service, DTV Airport, Darlington, Co Durham. DL2 1LU 07980 936007 01325 335346 Anthony.TYRER@uk.thalesgroup.com	The Operations Officer Thales Flight Inspection Service Durham Tees Valley Airport Darlington DL2 1LU 01325 335346
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ATS Units/ Controlling Agencies: Geographical Limits:

Birmingham ATC	0121 767 1210
East Midlands	01332 852993
Hawarden	01244 522012
Liverpool ATC	0151 907 154
London Information	124.750 MHz
Manchester ATC	0161 209 2835
Prestwick Centre	01294 655300
Shawbury (Ext 6202)	01939 250351
Swanwick Centre (GS Mids)	01489 612492
Swanwick(Mil) West	01489 612417
Valley (Ext 7462)	01407 762241
Warton	01772 852374



Airspace Reservations:

Nil

Departure/Destination Aerodrome(s) ACN Issued by:

EGNV AS3

Civil Aviation Authority, Aviation House, Gatwick
Direct Dial: 01293 768202
Email: AROps@caa.co.uk

SECTION 1: CO-ORDINATION ARRANGEMENTS (GENERAL)

1. The pilot/operator is requested to telephone the ATC authorities on the cover prior to departure in order to notify or update the sortie details including area(s) of operation and planned levels (quoting the ACN Reference). A minimum of 24 hours' notice should be given unless specified in Section 2.
2. There may be other aircraft and/or activities outside Controlled/Regulated Airspace unknown to ATC.
3. **The carriage and operation of a serviceable transponder (including Mode 'C') has been specified for all flight within Controlled airspace.**
4. The pilot will be responsible for obtaining all necessary ATC clearances and for maintaining R/T contact with appropriate ATC authorities.
5. The pilot/operator will be responsible for obtaining prior clearances to enter any UK Danger Areas affected by the flight profile from the appropriate Range Control Authority unless this is specifically detailed in Section 2.
6. Other Unusual Aerial Activities (UAAs) may be notified to SARG and may take place within the airspace encompassed by this survey. The pilot/operator is to ensure that UK Daily NOTAM Nav Warnings are consulted prior to each flight.
7. All flights within Controlled Airspace are subject to the requirements of a Flight Plan in accordance with UK AIP ENR1.10. The ACN Reference should be entered into Field 18 of the Flight Plan together with any relevant 'special handling' codes.
8. Flight prioritisation and Non-Deviating Status is in accordance with the information specified on the ACN Cover. Such status may be afforded to part or all of the flight – see Section 2.
9. Availability of an ATS from Swanwick (Mil) or Western Radar is subject to unit capacity, priorities and limitations of radar and radio coverage. Minimum pre-flight notification as per UK AIP ENR 1.6 unless otherwise specified in Section 2 of this ACN.
10. The CAA actively encourages the use of Moving map technology in the planning and flying phases of flights to reduce the risk of airspace infringements.

PUBLICATIONS AND CHANGES

11. The activity area may lie within Controlled and Uncontrolled Airspace as well as airspace reserved for military use. Aircrew are to thoroughly familiarise themselves with UK airspace structures and procedures, in particular those laid down within the UK Aeronautical Information Publication (UK AIP), ENR 1.1 and be fully conversant with UK Flight Information Services in accordance with UK CAP 493 (MATS Pt 1).
12. The CAA VFR 1:500,000 and 1:250,000 charts and the UK AIP ENR 5 depict some, but not all aviation activity sites and amendments should also be checked. Please refer to <http://www.nats-uk.ead-it.com>
13. This ACN details specific coordination essential to the activity taking place and does not remove the need for aircraft operators to comply with national flight planning and notification procedures. Pilots and ANSPs are required to ensure that all related aviation sites are aware of this planned activity and of subsequent changes not captured within this document.
14. The Sponsor or Event Organiser should co-ordinate any changes to this ACN with SARG quoting the ACN Reference at the top of the page.

SECTION 2: CO-ORDINATION ARRANGEMENTS (SPECIFIC)

15. This ACN details aerial activity in the vicinity of the RAF Shawbury in support of the calibration of the WAM radar. It is a calibration flight to follow the flight trials covered in ACN 2020-08-0331 but due to a significantly smaller range of activities a new ACN has been issued.

16. **Priority.** Due to prevailing traffic conditions on the day, there may be level restrictions and/or the aircraft may be provided vectors to allow most efficient use of airspace. For flight within controlled airspace (CAS), the aircraft may be required to hold until a suitable gap in traffic is available.

17. **Liaison.** At the start of each day, the pilot will contact relevant ATC agencies to discuss sortie details and planned levels for that day.

18. The profiles will be flown at 5000ft and 8000ft; exact serials will be notified by the crew during their liaison calls.

19. The calibration will take approximately 2 nights flying (2 x 4hr sorties per day) and may be flown more than once. One night will cover the Mode A/C profile (both 5000ft and 8000ft) and the next night will cover the Mode S (both 5000ft and 8000ft).

20. In order to reduce the impact to flights within CAS, the sponsor should look to conduct those profiles which enter CAS after 2200 UTC unless prior coordinated with the relevant ATC agencies.

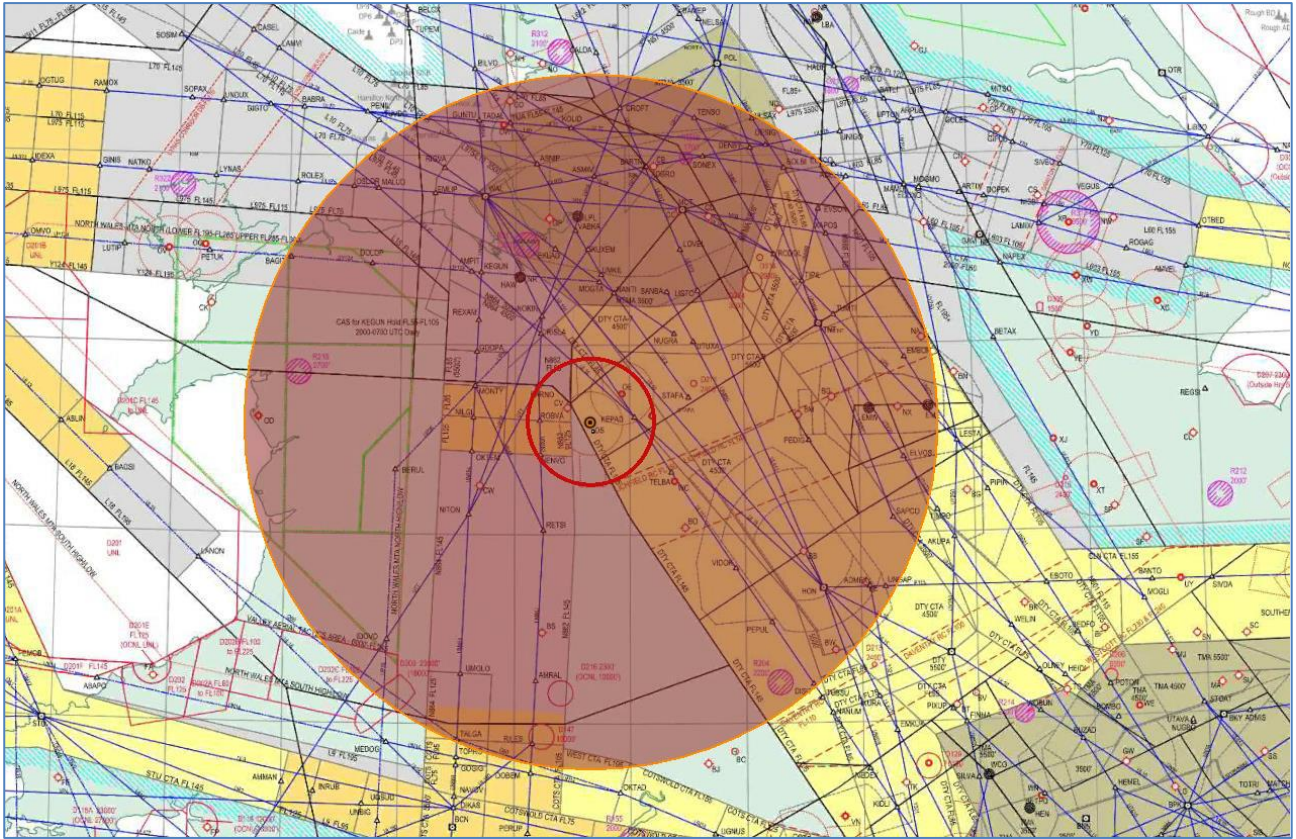
Trajectory	Levels	ATS Authority
Segments of the Mode A/C TMA Trajectory	5000ft AMSL 8000ft AMSL No other levels are required	Shawbury Warton Prestwick ACC East Midlands Valley London Information Manchester Birmingham Liverpool
Mode S TMA Trajectory	5000ft AMSL 8000ft AMSL No other levels are required	Shawbury Warton Prestwick ACC Swanwick ACC East Midlands Valley London Information Manchester Birmingham Liverpool

SECTION 3

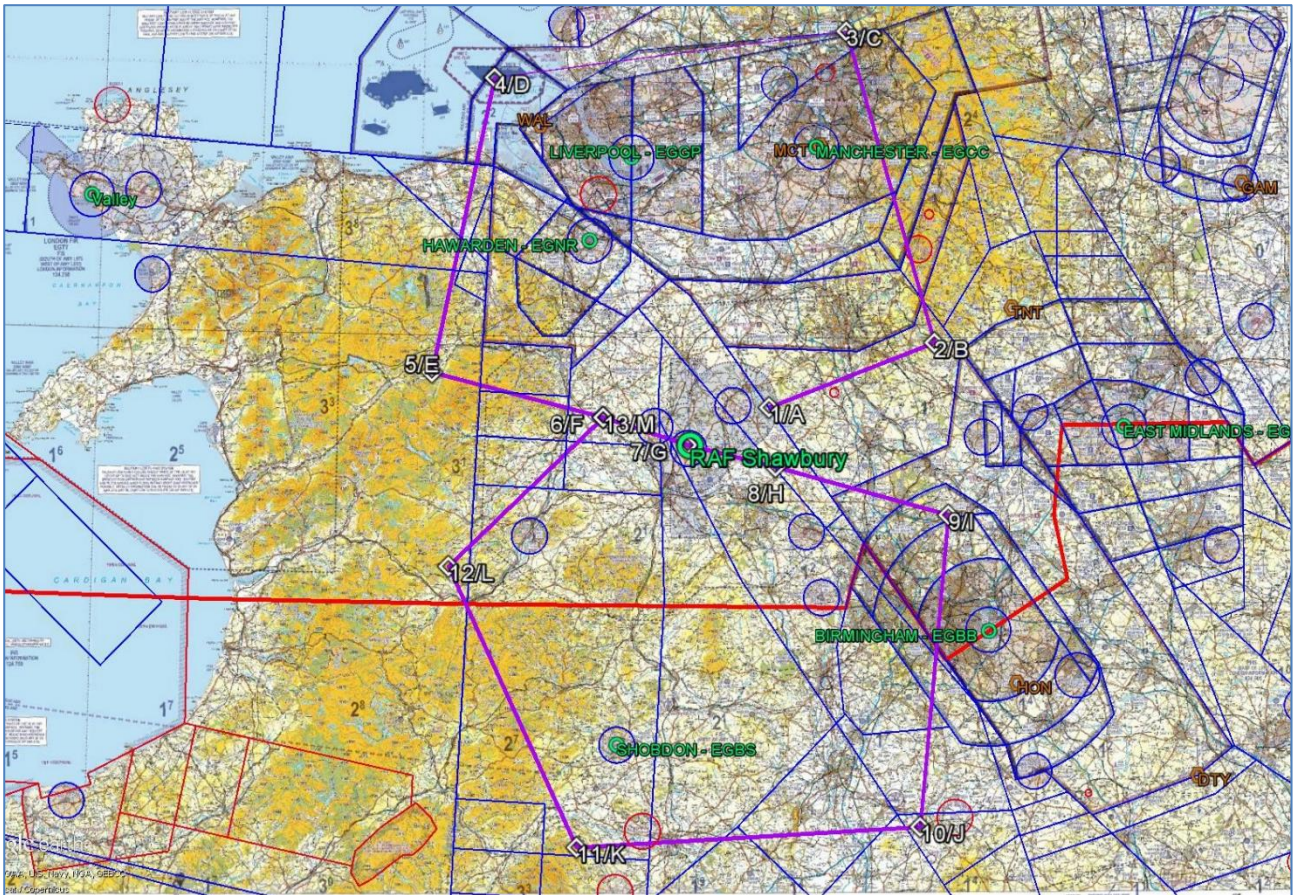
Area of Operation

21. Mapping highlighting the area of operations is shown below. Mapping is for illustrative purposes only and not for operational planning.

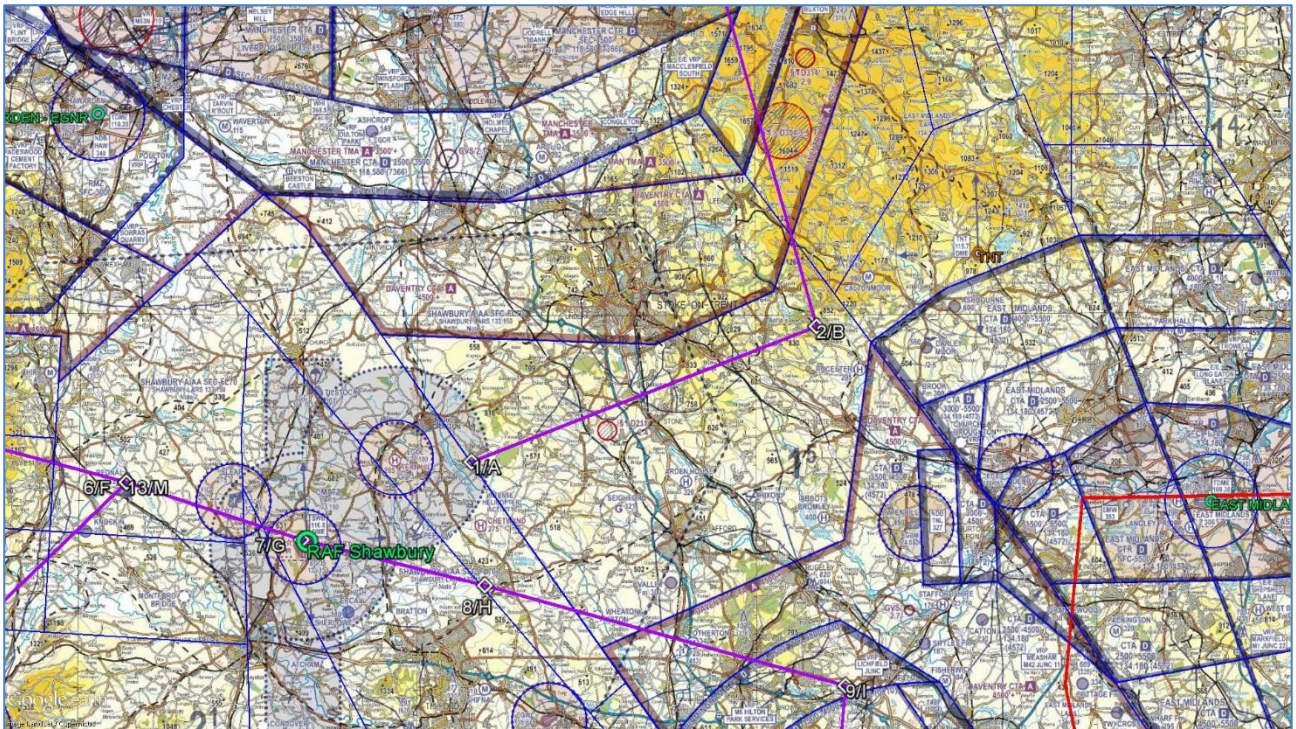
Chart of the Operating Area



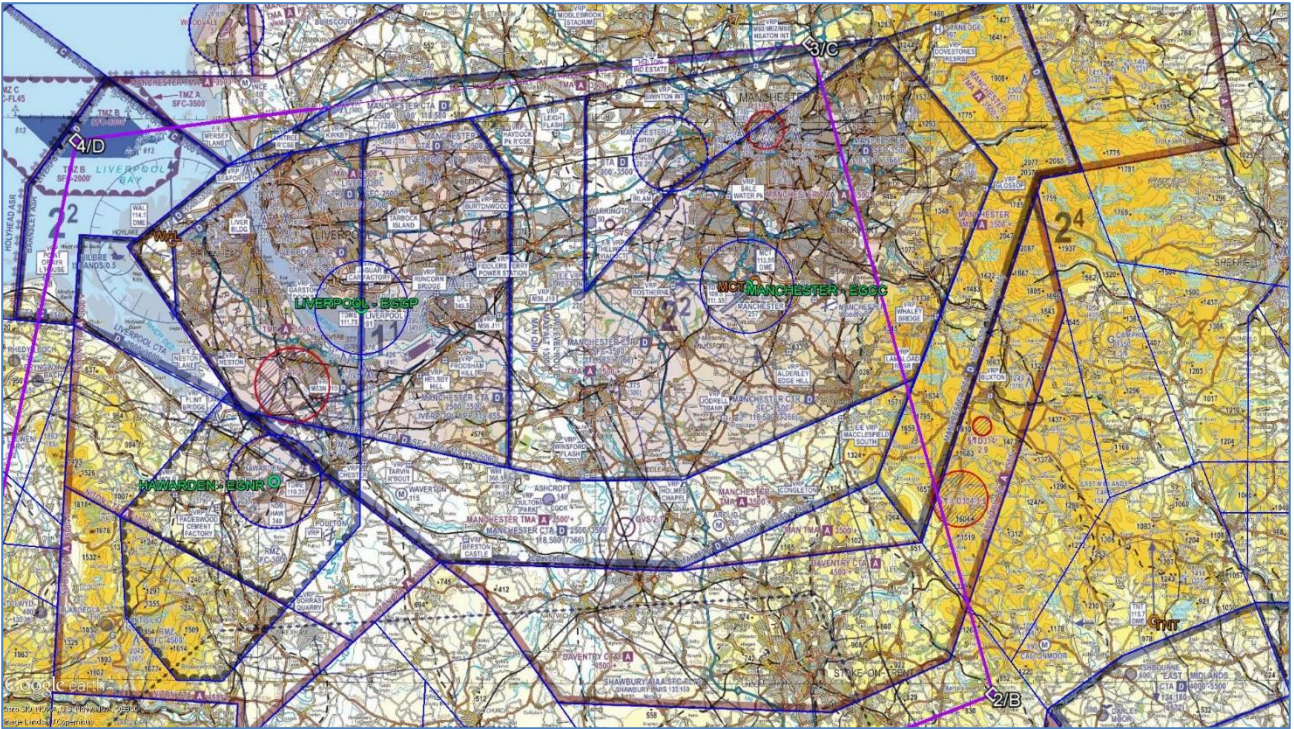
5000ft AMSL – Overview



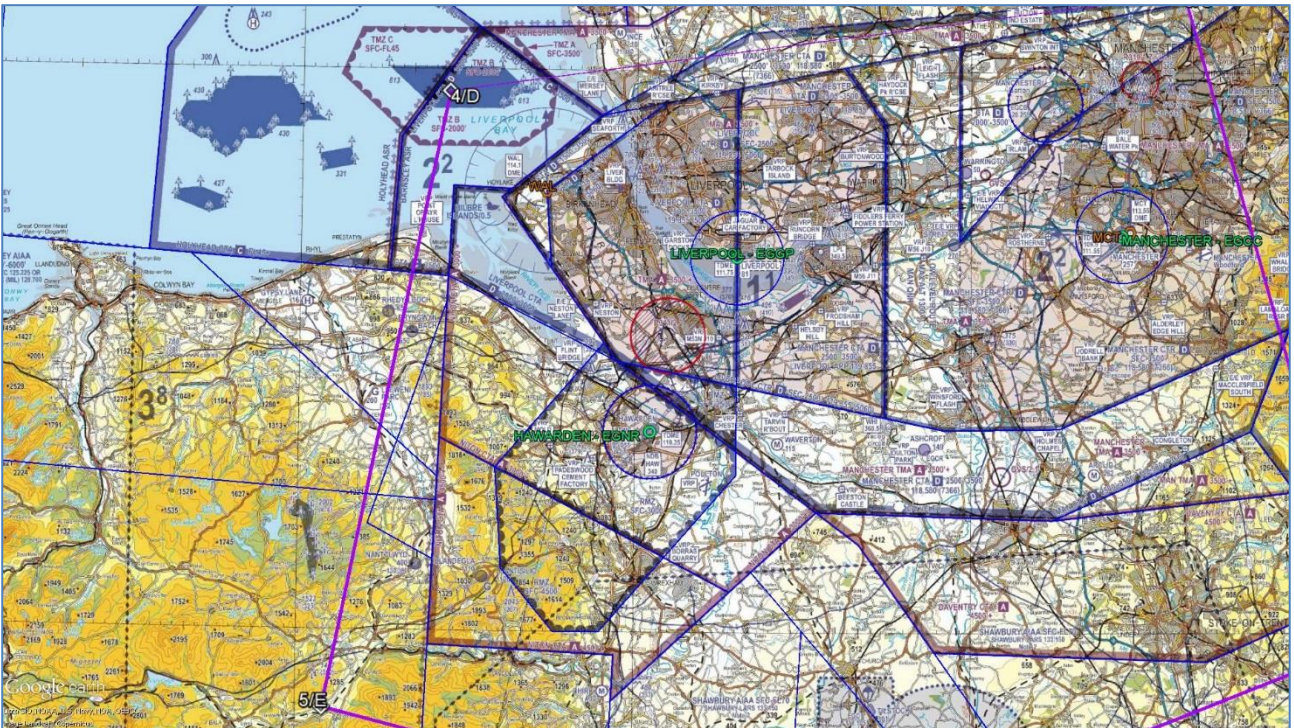
5000ft AMSL – Legs 01 to 02



5000ft AMSL – Legs 02 to 04



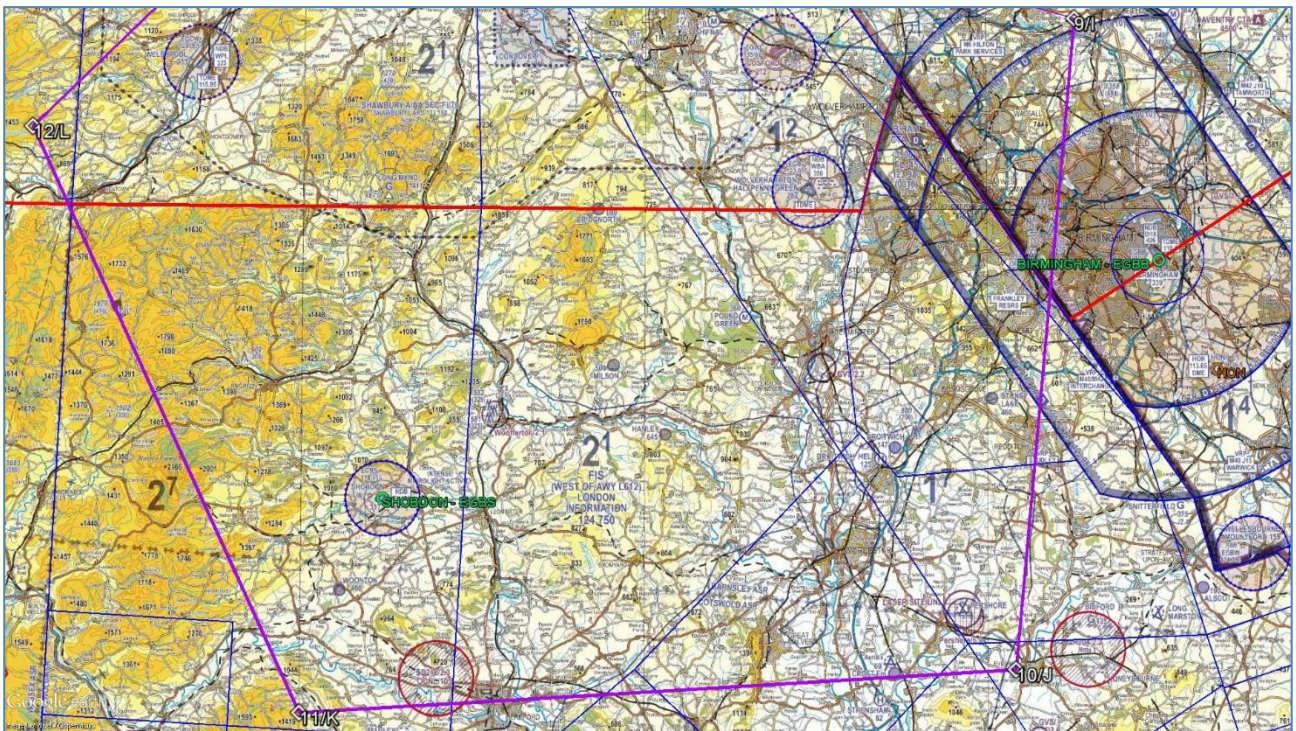
5000ft AMSL – Legs 04 to 05



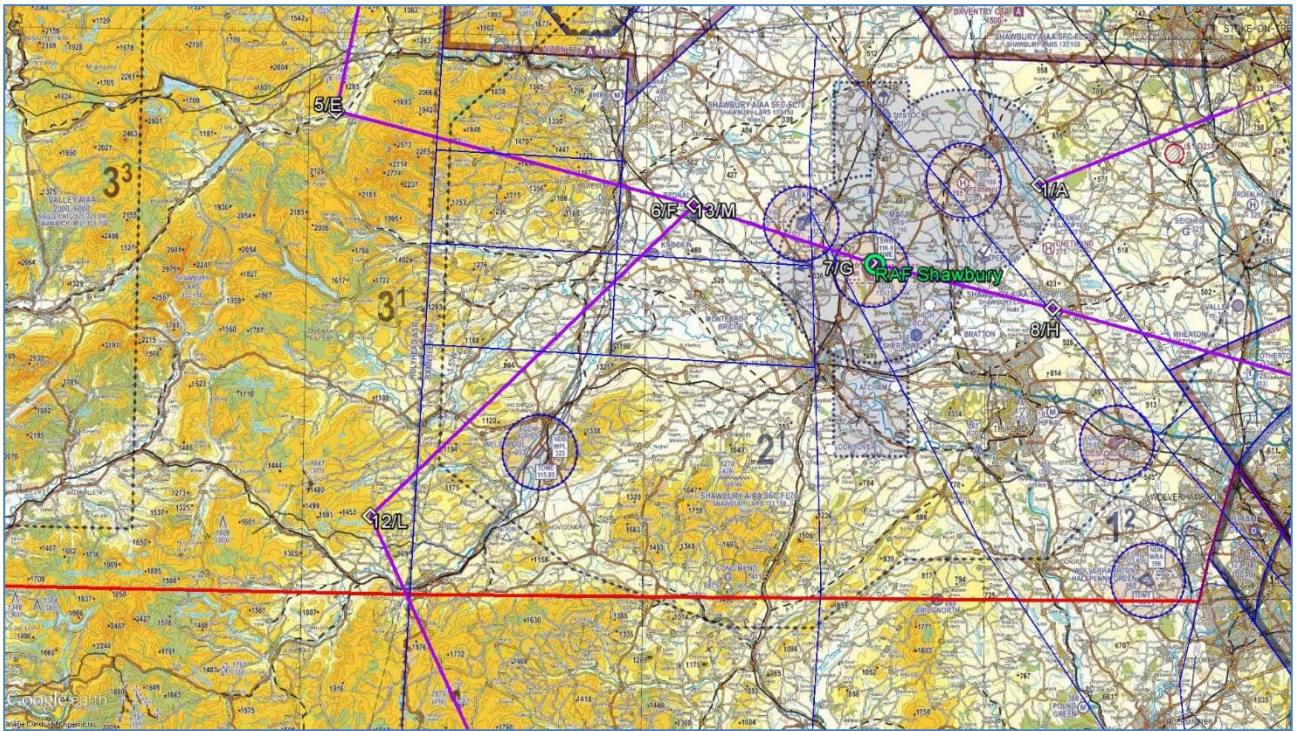
5000ft AMSL – Legs 05 to 09



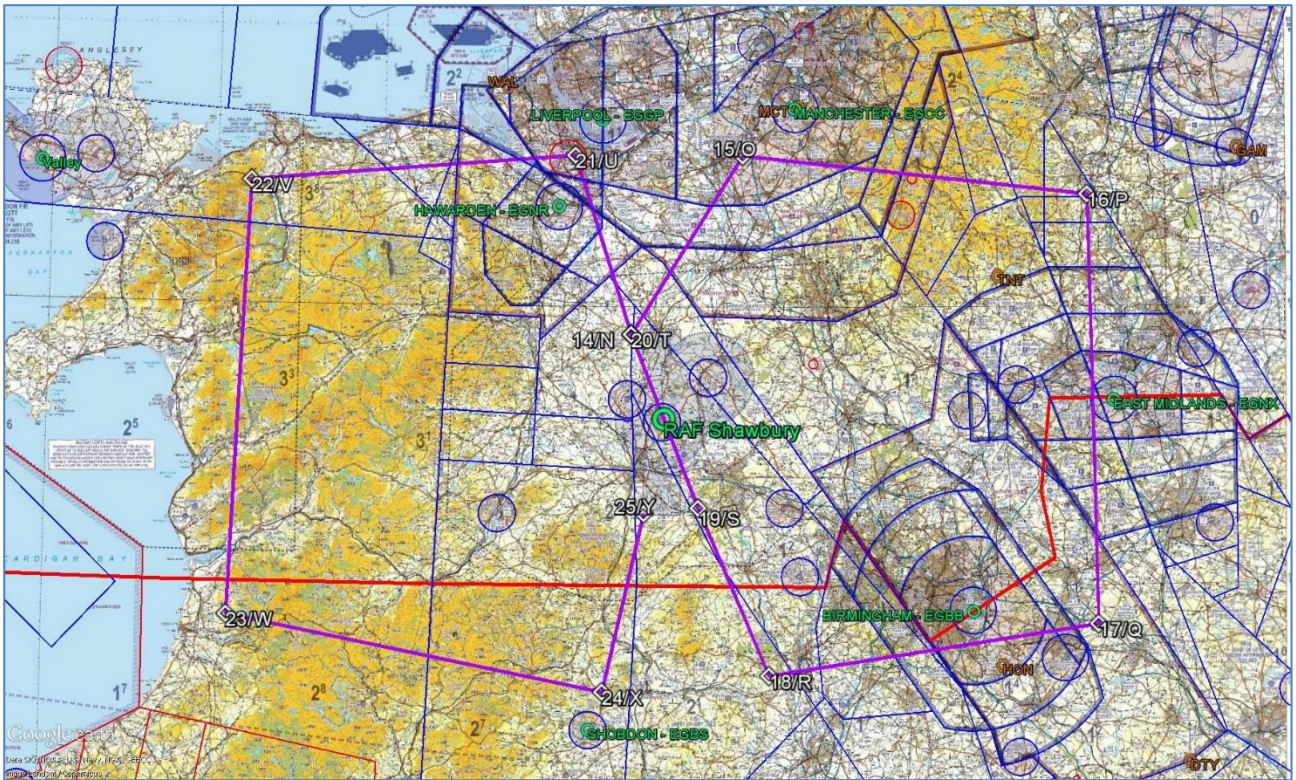
5000ft AMSL – Legs 09 to 12



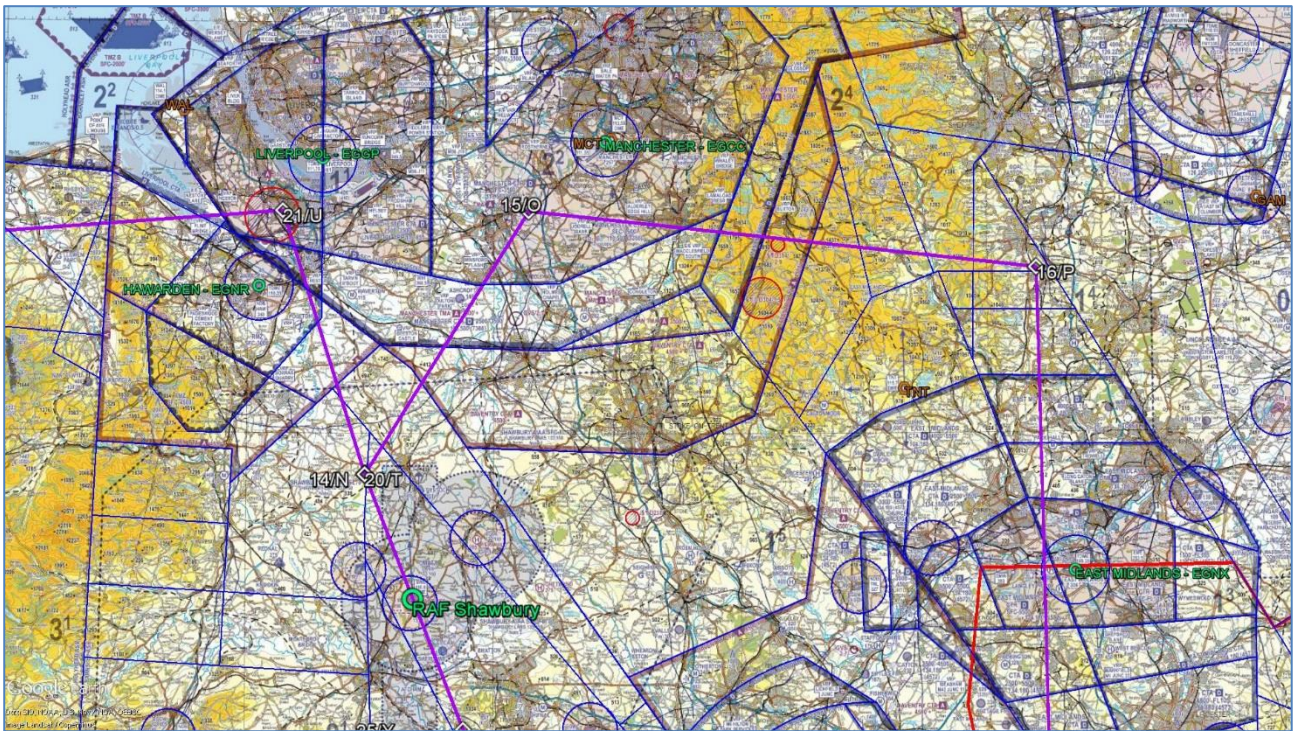
5000ft AMSL – Legs 12 to 13



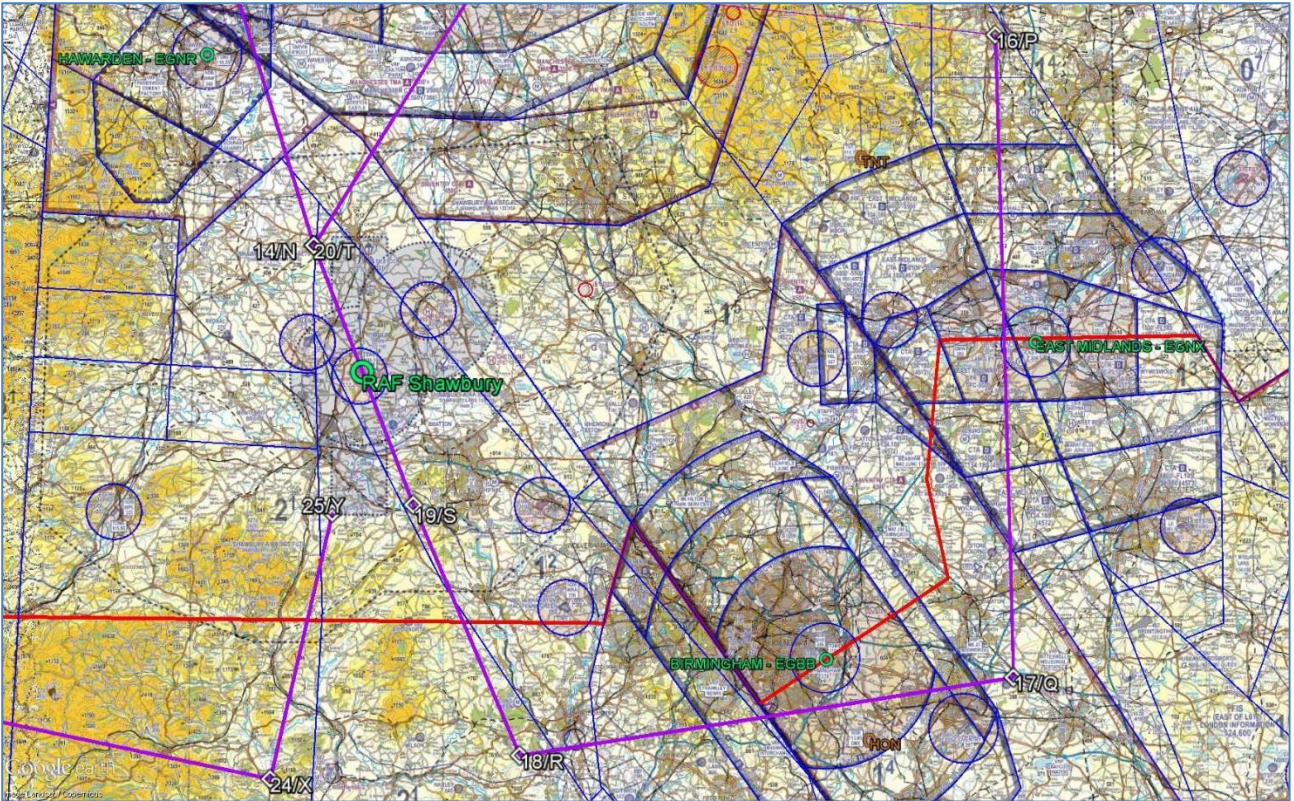
8000ft AMSL – Overview



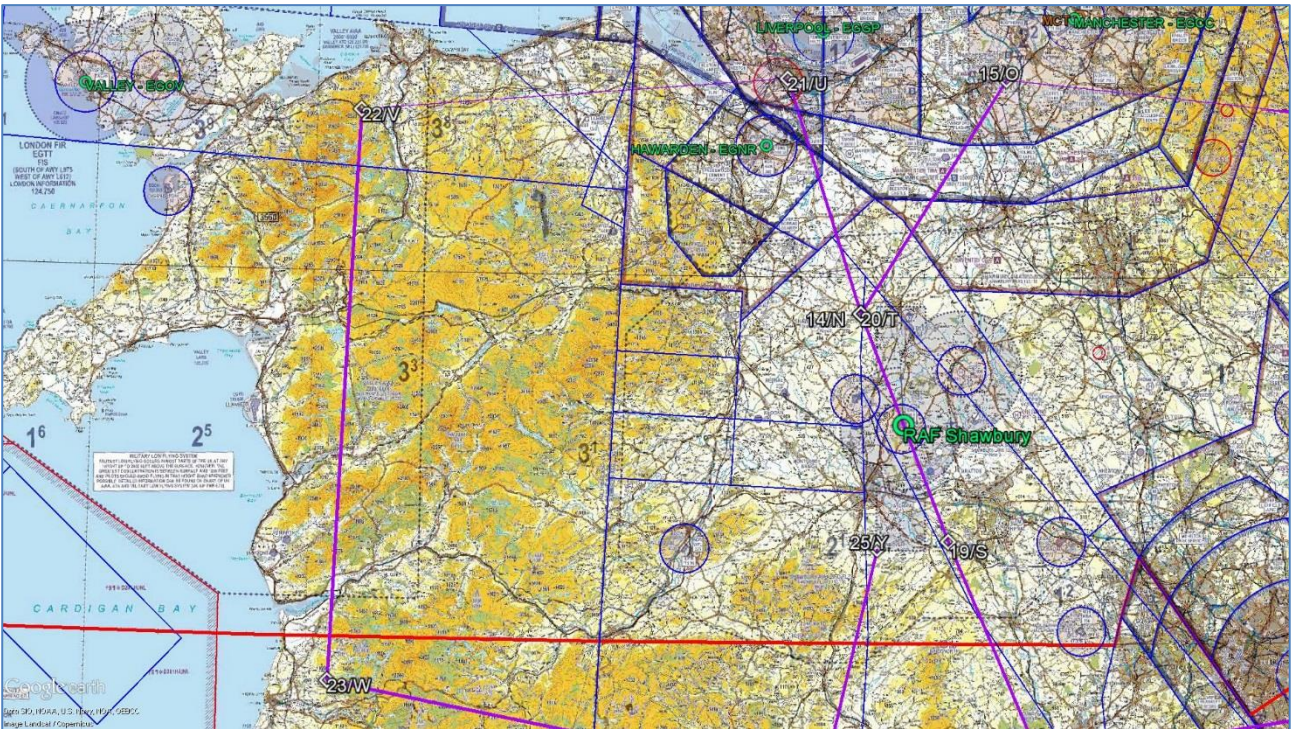
8000ft AMSL – Legs 14 to 16



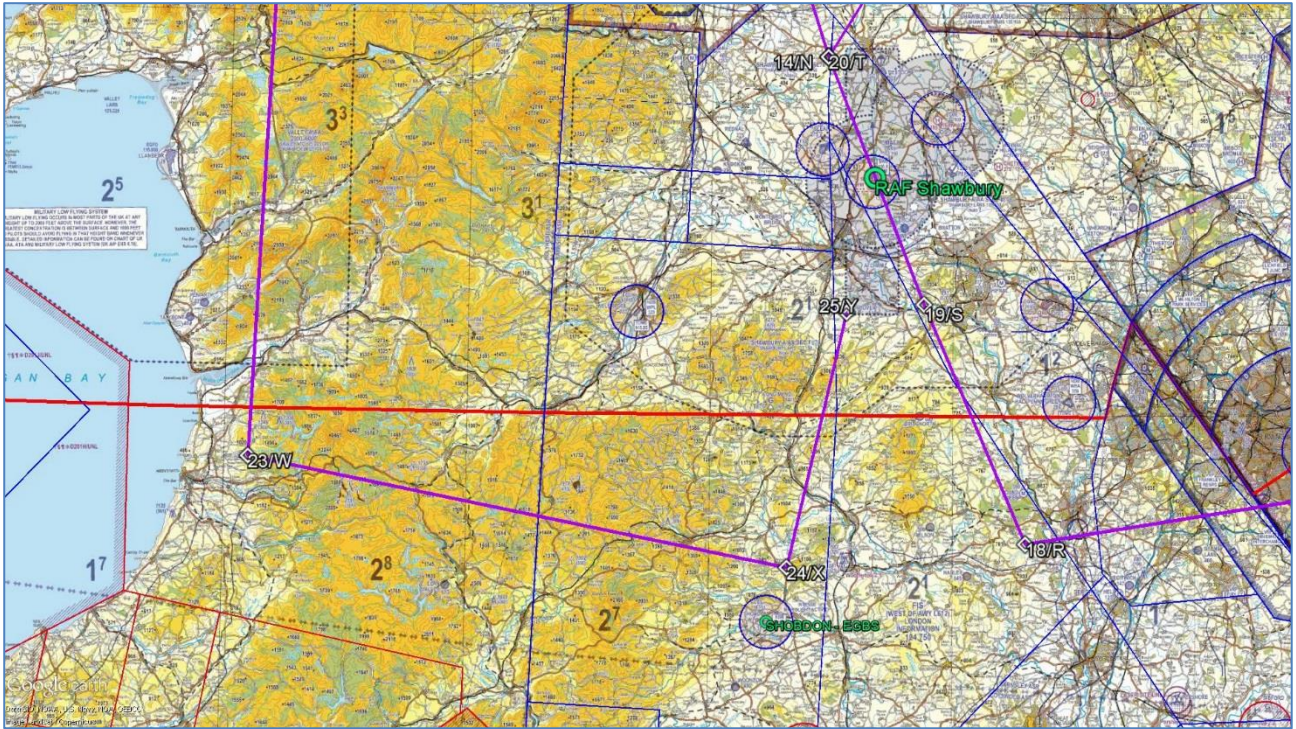
8000ft AMSL – Legs 16 to 20



8000ft AMSL – Legs 20 to 23



8000ft AMSL – Legs 23 to 25



2. FLIGHT TESTS

Dedicated flight tests are used to generate ASTERIX and GPS data for the SSAT where the aircraft's behaviour can be controlled and position can be measured using high accuracy GPS equipment. The flight tests are broken into trajectories which allow the collected data to be indexed to the corresponding test procedure. The trajectories are further broken down into segments (corresponding to waypoints) in order to clearly define how the flight test will be conducted.

2.1. MODE S TRAJECTORIES

All Mode S trajectories are flown with only the Mode S transponder active.

2.1.1 Mode S TMA Trajectory

This flight test should be flown at a reasonably constant speed as not to generate more or less data in a specific area of the coverage.

The Mode S TMA trajectory is shown in the following figure.

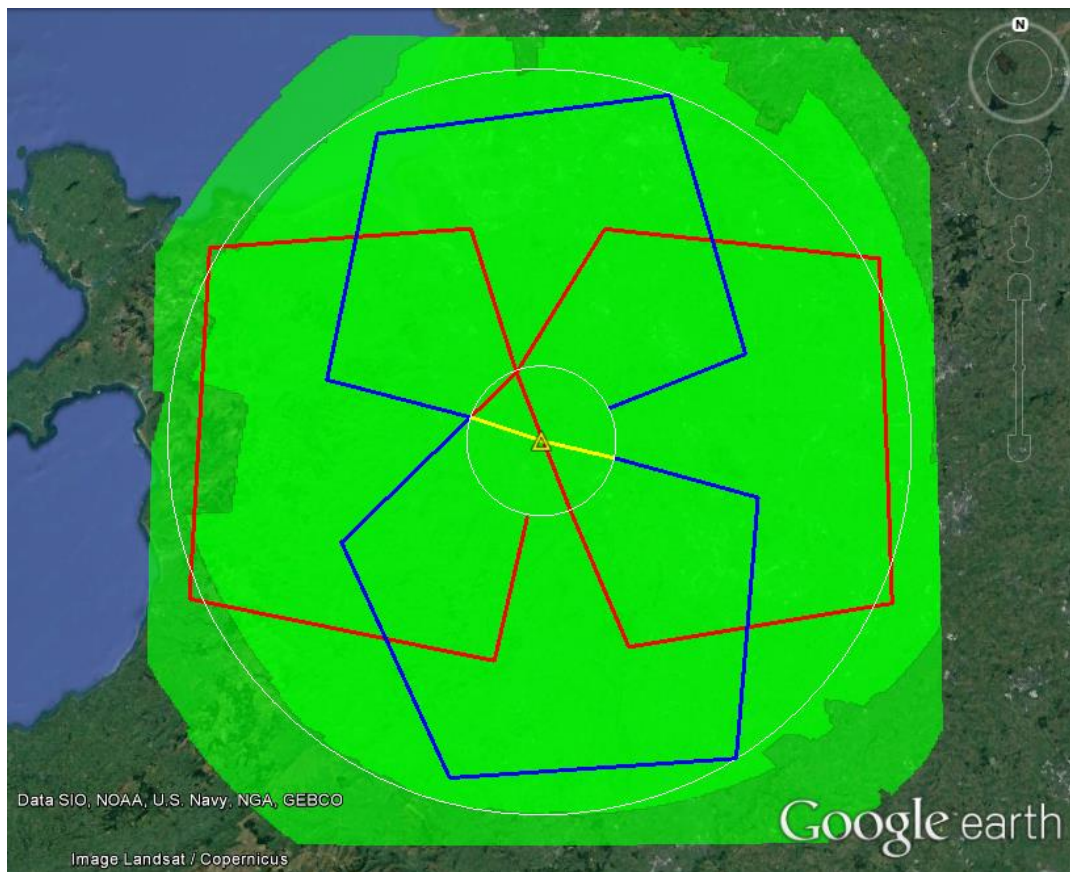


Figure 2-1: Mode S TMA Trajectory

In the above figure: the blue segments represent the parts of the trajectory flown at FL50, the yellow segments represent a low pass maneuver down to 150 ft AGL at RAF Shawbury, the red segments represent the parts of the trajectory flown at FL80, the white range rings show 10 NM and 50 NM, the green polygons show the area of the N-1 coverage at FL50 and FL80, and the yellow triangle shows the ARP.

The following table describes each segment of the Mode S TMA trajectory.

Table 2-1: Segments of the Mode S TMA Trajectory

No.	Name	LAT (decimal degrees)	LON (decimal degrees)	Altitude	Distance [km]	Notes
1	A	52.87	-2.42	FL50	193.81	Take off from EGNV (Durham Tees Valley Airport) and fly to waypoint A. Before reaching waypoint A adjust to and maintain FL50.
2	B	52.99	-1.91	FL50	36.80	After Waypoint A the flight test starts.
3	C	53.57	-2.18	FL50	67.02	
4	D	53.48	-3.28	FL50	73.64	
5	E	52.93	-3.46	FL50	62.38	
6	F	52.85	-2.93	FL50	36.77	
7	G	52.80	-2.67	150 ft AGL	18.58	After waypoint F start the approach to the active runway at EGOS (RAF Shawbury) and perform a low pass along the runway down to 150 ft AGL.
8	H	52.76	-2.40	FL50	18.58	After the low pass at EGOS (RAF Shawbury) climb to and maintain FL50.
9	I	52.67	-1.87	FL50	37.19	
10	J	52.09	-1.96	FL50	64.83	
11	K	52.05	-3.00	FL50	71.45	
12	L	52.57	-3.40	FL50	63.97	
13	M	52.85	-2.93	FL50	44.50	
14	N	52.95	-2.76	FL80	15.96	After waypoint M climb to and maintain FL80.
15	O	53.27	-2.43	FL80	41.91	
16	P	53.20	-1.40	FL80	69.21	
17	Q	52.43	-1.38	FL80	85.70	
18	R	52.34	-2.35	FL80	66.80	
19	S	52.64	-2.56	FL80	36.36	
20	T	52.95	-2.76	FL80	36.31	
21	U	53.27	-2.93	FL80	37.04	
22	V	53.22	-3.90	FL80	64.99	
23	W	52.44	-3.95	FL80	86.87	
24	X	52.31	-2.84	FL80	76.97	
25	Y	52.63	-2.72	FL80	36.53	
26	EGNV	54.51	-1.43	N/A	225.94	After waypoint Y the flight test ends. Return to EGNV (Durham Tees Valley Airport).
					1670.11	Total distance of trajectory

The above segments should be flown in the order given. If it is necessary for the aircraft to land during the flight test (e.g. to refuel) the trajectory should be resumed at the end of the last completed segment. If it is necessary for the aircraft to deviate from the trajectory for safety reasons the trajectory should be resumed at the next safe entry point.

2.2. MODE A/C TRAJECTORIES

All Mode A/C trajectories are flown with only the Mode A/C transponder active.

2.2.1 Mode A/C TMA trajectory

This flight test should be flown at a reasonably constant speed as not to generate more or less data in a specific area of the coverage.

The Mode A/C TMA trajectory is shown in the following figure.

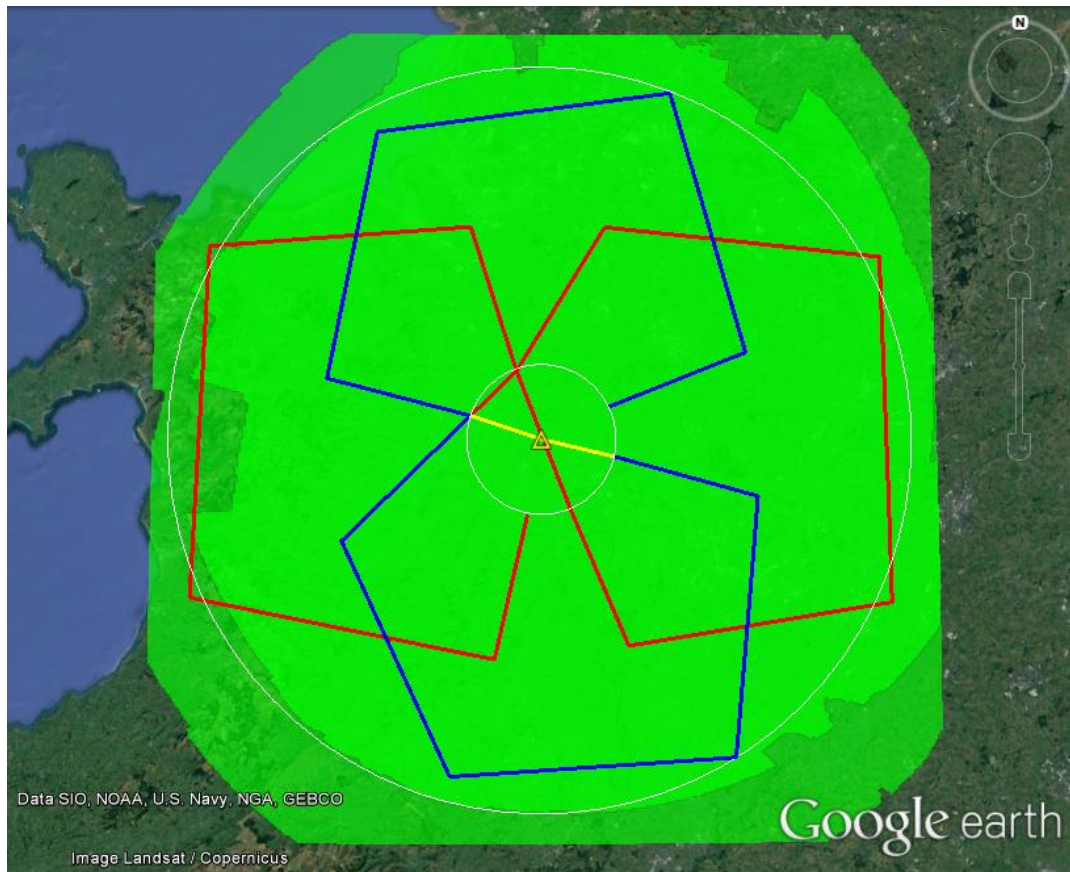


Figure 2-2: Mode A/C TMA trajectory

In the above figure: the blue segments represent the parts of the trajectory flown at FL50, the yellow segments represent a low pass maneuver down to 150 ft AGL at RAF Shawbury, the red segments represent the parts of the trajectory flown at FL80, the white range rings show 10 NM and 50 NM, the green polygons show the area of the N-1 coverage at FL50 and FL80, and the yellow triangle shows the ARP.

The following table describes each segment of the Mode A/C TMA trajectory.

Table 2-2: Segments of the Mode A/C TMA Trajectory

No.	Name	LAT (decimal degrees)	LON (decimal degrees)	Altitude	Distance [km]	Notes
1	A	52.87	-2.42	FL50	193.81	Take off from EGNV (Durham Tees Valley Airport) and fly to waypoint A. Before reaching waypoint A adjust to and maintain FL50.
2	B	52.99	-1.91	FL50	36.80	After Waypoint A the flight test starts.
3	C	53.57	-2.18	FL50	67.02	
4	D	53.48	-3.28	FL50	73.64	
5	E	52.93	-3.46	FL50	62.38	
6	F	52.85	-2.93	FL50	36.77	
7	G	52.80	-2.67	150 ft AGL	18.58	After waypoint F start the approach to the active runway at EGOS (RAF Shawbury) and perform a low pass along the runway down to 150 ft AGL.
8	H	52.76	-2.40	FL50	18.58	After the low pass at EGOS (RAF Shawbury) climb to and maintain FL50.
9	I	52.67	-1.87	FL50	37.19	
10	J	52.09	-1.96	FL50	64.83	
11	K	52.05	-3.00	FL50	71.45	
12	L	52.57	-3.40	FL50	63.97	
13	M	52.85	-2.93	FL50	44.50	
14	N	52.95	-2.76	FL80	15.96	After waypoint M climb to and maintain FL80.
15	O	53.27	-2.43	FL80	41.91	
16	P	53.20	-1.40	FL80	69.21	
17	Q	52.43	-1.38	FL80	85.70	
18	R	52.34	-2.35	FL80	66.80	
19	S	52.64	-2.56	FL80	36.36	
20	T	52.95	-2.76	FL80	36.31	
21	U	53.27	-2.93	FL80	37.04	
22	V	53.22	-3.90	FL80	64.99	
23	W	52.44	-3.95	FL80	86.87	
24	X	52.31	-2.84	FL80	76.97	
25	Y	52.63	-2.72	FL80	36.53	
26	EGNV	54.51	-1.43	N/A	225.94	After waypoint Y the flight test ends. Return to EGNV (Durham Tees Valley Airport).
					1670.11	Total distance of trajectory

The above segments should be flown in the order given. If it is necessary for the aircraft to land during the flight test (e.g. to refuel) the trajectory should be resumed at the end of the last completed segment. If it is necessary for the aircraft to deviate from the trajectory for safety reasons the trajectory should be resumed at the next safe entry point.