



REPORT ON FASVIG/NATS/CAA VISIT TO DFS AT LANGEN CAMPUS 7TH FEBRUARY 2018

1. Introduction

- 1.1 During a meeting between the GAA Alliance and NATS in December 2017, it was agreed that it would be beneficial to understand how VFR/IFR integration was managed in another State, and this intelligence used as input to identify possible changes to airspace and procedures within the UK. Germany was offered by the GA community as a good example of integration that meets the needs of both the IFR & VFR communities and consequently a visit to the headquarters of the German ANSP DFS at Langen took place on the 7th Feb 2018. The attendees and agenda for the day are at Annex A.
- 1.2 The Langen campus is also home to the Langen ACC, which manages arrivals and departures for Frankfurt and Cologne/Dusseldorf International airports. The site is also in the transition to housing a centralised FIS function for all German airspace. The campus has a workforce of over 4,000 people.
- 1.3 In order to get the most out of the visit, DFS was supplied with a set of questions in advance of the meeting, which were agreed as providing a reasonable snapshot of how VFR traffic is handled within CTRs/CTAs and in the en-route environment. This report is structured around those questions but it also contains other useful information that was gleaned on the day.
- 1.4 It should be noted that in the time available, a comprehensive understanding of how German airspace is structured and managed was not possible so consequently the report is a high level overview and would require further investigation if more detailed information is required.

2. Questions

2.1 *What type of airspace do you make available (classification, levels etc.)*

In ascending order of restriction German airspace is:

1. Class G. Ground (GND) to 1,000ft/2,500ft AGL

Note: No IFR routes in Class G

2. Class G with RMZ. GND to 1,000ft AGL
Note: For uncontrolled aerodromes with IFR movements below 14,000kg
3. Class E from 1,000ft/2,500ft AGL (above Class G), to FL100
Note: Mode S Transponder requirement for powered aircraft above 5,000ft AMSL and for gliders above 10,000ft AMSL.
4. Class E with TMZ
Note: For Regional aerodromes with IFR movements. Frequency Monitoring Codes used.
5. Class D CTRs. GND to 1,500ft/2,500ft AGL
6. Class D CTAs/TMAs. Generally:
 - above CTRs to FL60, or
 - between FL60 to FL100 between Class C airspacesNote: Transponder required for all aircraft. Individual clearances available for non-transponding aircraft.
7. Class C CTAs/TMAs:
 - above CTRs up to FL60
 - above Class D to FL100Note: Transponder required for all aircraft. Individual clearances available for non-transponding aircraft.
8. Class C FL100 and above

Germany has no Class A, B or F airspace.

Other information

- German State approves all airspace classifications.
- German law stipulates two levels of implementation:
 - Minimum requirement for IFR commercial air transport operations (CAT) ('min requirement') with aircraft of over 14,000kg MTOW (SAAB 2000 MTOW 22,225kg) - the establishment of controlled aerodromes (ATC) and Instrument Approach Procedures, Class D CTRs, overlaying Class E airspace and RMZs in Class G.
 - To increase safety for IFR CAT Operations - as required, Class C/D CTAs, RMZ and/or TMZ.
- For proposed airspace implementations outside the min requirement, with Industry consultation the German State has published a set of design criteria in order of priority:
 1. Quantifiable air safety related incidents.
 2. Quantifiable IFR traffic volume. Resulting airspace determined from a look-up table (see Annex B).
 3. Qualitative assessment of local traffic mix.
 4. Qualitative assessment of local complexity.

- Changes to routes or IFPs that do not result in changes to noise agreements or will not require extensions of existing CAS, do not need to be consulted on. Otherwise consultation required with certain German State departments, noise bodies and specific user representatives, who have 4 weeks to respond.
- In the German State DFS is the En-route ANSP and with the exception of small regional airports, operates most of the bigger airports in Germany. Responsible for undertaking all airspace change.
- 'Min requirement' airspace implementations can take place at any time of the year. Digital 1: 250,000 charts published accordingly.
- For other airspace changes, implementations takes place yearly in March following engagement with airspace users (mostly Sport Aviation) the previous Summer/Autumn. The change is designed to coincide with the publication cycle of the 1:500,000 chart.
- All parties work together to achieve agreement. For contentious proposals, the German State will adjudicate and will always approve if safety for IFR operations is the main proven driver for the change.
- Air Sports bodies monitor traffic levels at airports using public data and can propose reduction of CAS.

2.2 *What process do you go through to release such airspace and how do you promulgate it to all.*

Germany has 3 levels of FUA for glider access to specific 'sectors' in TMA airspace (Class C/D CTAs) and TMZs:

- Public Glider Sectors:
 - National agreement for all German glider pilots but in practice the special briefings required for Frankfurt results in some nominated clubs having the most access. Some access issues for non-nominated 3rd party clubs.
 - Sector availability may be for whole or only part of area.
 - Sectors depicted on special 1:500,000 charts published for glider pilots only.
 - Special 'Glider ATIS' frequency. Sector activation/deactivation status transmitted by controlling authority. Pilots free to enter areas without clearance. Pilots maintain listening watch on frequency. Pilots can also request activation on FIS frequency.
- Regional Glider sectors:
 - Regional agreement between ACC/Airport and specified glider aerodromes. Designated individual at user aerodrome asks ACC for sector activation via telephone-line. Co-ordinator permanently available during sector activation. In case of sector de-activation, co-ordinator has to notify all gliders have left the sector within a specific time.

- Local Glider Sectors
 - Local agreement between ACC and a specified aerodrome.
 - Special procedures for CTR access published in AIP VFR.

Additionally Germany has 'Glider Sectors' which are areas reserved for autonomous operations from GA aerodromes within CTRs. These are agreed with the local ATC unit.

Germany categorises Class D CTRs as either 'H24' or 'HX':

- Class D CTR HX airspace reverts to the background classification (Class E or G) when there are no IFR flights. The opening and closing times for Class D CTR HX airspace are published in the AIP.
- Up-to-date status of HX airspace may be obtained from FIS or from the Aerodrome Control frequency. If status cannot be obtained, airspace is avoided.
- Only one 'special' Class C/D CTA/TMA airspace is designated as HX airspace.
- HX arrangements not currently applied within RMZs and TMZs.

Other information

- Glider Sectors limited to 10,000ft. Background classification of CTA/TMA airspace becomes Class E when active.
- Special charts showing the Glider Sectors are published on the Internet. Glider Sectors not shown on normal charts, areas not known to powered GA.
- No transponder requirement for gliders in Sectors. DFS indicated that they wanted to take advantage of electronic conspicuity, particularly by transponders, but wanted to avoid RDP display issues similar to those experienced in the Netherlands.
- The German gliding community appears content with TMZ arrangements rather than have Class D established. Battery technology improved making transponders feasible.
- Most new gliders come with a Mode S option but uptake is slow. Installation in existing gliders is seen as prohibitive. Community prefers technologies that give them information on airborne environment e.g. FLARM.
- Germany has about 7,500 active gliders.
- Gliding sectors not designed for powered GA. This community happy to fly within Class E airspace, under/around Class C/D, or get access to Class C/D via FIS.
- Gliding and powered GA happy to comply with SERA VMC criteria. Little appetite amongst the general GA community in Germany to operate in marginal VMC. GA would not contemplate operating in IMC without receipt of an ATS service

- The yearly engagement by DFS with the GA community is mostly attended by the gliding community. Powered GA appears to accept that what is good enough for gliders is good enough for them.
- In Germany there is a greater distinction between 'normal' GA and Air Sports activities.

2.3 Do you still provide ATS within the area once released.

No. Glider Sectors are segregated airspace. ATC avoid active Sectors by 1nm lateral and 500ft vertical. Some IFR impact. ATC deem observed tracks to be inside Sectors. No traffic information passed.

2.4 What process do you go through to reclaim such airspace and how do you ensure it has returned to its original state.

For Public Sectors, the glider ATIS or FIS frequency notifies de-activation. It is expected that after 10 mins the area have been evacuated. No other confirmation available.

For Regional Sectors, notified co-ordinator in communication with gliders will notify de-activation. It is expected that after 15 mins the areas have been evacuated. No other confirmation available.

For Local Sectors, the local airfield's frequency is monitored by gliders (frequency can be shared by more than one airfield). Activity status of areas managed by ATC controlling authority and airfield(s) via direct landline and activation/de-activation status transmitted to airborne aircraft.

2.5 What are the VFR weather criteria used within the airspace, is this something that ATS provider is required to take into consideration.

Gliders comply with the SERA VMC criteria for the applicable airspace.

2.6 What are the transponder carriage criteria within the area, is this something that the ATS provider is required to take into consideration.

Transponders required for gliders only above 10,000ft, non-equipped access subject to ATC. If areas used by powered GA, transponder required above 5,000ft.

2.7 What are the advantages and disadvantages associated with the FUA concept that you employ.

DFS view these arrangements as a compromise that is acceptable to both parties. Individual clearances for ad hoc flights are always available subject to workload.

2.8 Do you allow autonomous VFR operations within your CTR/CTAs? For example the segregation of airspace to allow operators to use airspace without the need for direct contact with ATC.

For CTRs, yes for gliders only. The agreement with the local ATC unit provides the standing clearance. Other GA can obtain a normal clearance or avoid the airspace.

2.9 Do you incorporate VFR/SVFR lanes within controlled airspace that are deemed separated from IFR activity?

No

2.10 Does DFS have standalone FIS positions at either Aerodromes or ACCs, and what level of ATS to en-route GA is provided.

A few years ago DFS instituted a change in its FIS provision. Where previously controllers at Airports/ACCs were reluctant to provide a FIS to VFR traffic outside Class C/D, leading to many infringements, DFS decided to establish a centralised FIS function for all German airspace at Langen (not yet complete). The service is heavily marketed and appears to be well used by GA. The FIS positions:

- Use surveillance situation displays
- Are manned by FISOs.
- Have ground-ground communications to the relevant ACC Sector/Aerodrome in their area.
- May retain aircraft on frequency when passing through a TMZ, or transfer to aerodrome managing TMZ.
- Make no distinction in the level of ATS provided in either Class E or Class G airspace.
- GAFOR is displayed and widely used.

2.11 *Where DFS has standalone FIS positions, is there any surveillance capability and if so how is it used.*

FISO provides ICAO FIS. Additionally, as allowed for by ICAO, surveillance information is used to supplement service e.g. information on collision hazards, potential infringements.

2.12 *Excepting the SERA flight plan requirements, does Germany have additional VFR flight plan requirements within the State.*

No.

2.13 *Does DFS have the FDP capability to manage and display VFR flight plans at their ATS units.*

Yes. Non-DFS aerodromes also receive flight plan data from DFS. FPLs are 'opened' and 'closed' throughout Germany with receiving airfield initiating overdue action, if required.

2.14 *Does DFS provide an inter-unit co-ordination facility units to pass FPL or abbreviated flight plan data ahead of transfer of communications.*

FIS will acquire clearances through Class C/D CAS and either retain aircraft on frequency or transfer to relevant agencies. Aircraft may return to FIS frequency once clear of Class C/D CAS. Flight plan (not ICAO FPL) details retained for aircraft's flight.

3. German CTRs

3.1 German CTRs are based on the ICAO guidance (minimum 3nm wide from runway, min 5nm long) but for larger airports these dimensions are exceeded.

3.2 The brief introduction to German airspace did not allow us understand the design choices and traffic considerations that went into each CTR construct although it is noticeable that they do have extensive Class C/D CTA airspace above the CTRs.

3.3 With the exception of Cologne/Dusseldorf, the major German International Airports are not situated in close proximity to each other and consequently their arrival/departure flight procedures do not generally interact with each other. This enables the airspace design to take advantage of modern aircraft climb performance, which in turn can result in smaller CAS containment requirements.

4. General information

- With the exception of SIDs and Approach procedures at uncontrolled IFR aerodromes, all published SIDs, STARs, ATS routes (above FL100) and Approach procedures lie within existing Class C/D/E (with/without TMZ) airspace.
- Aerodrome FISO (AFISO) provides ICAO/SERA FIS. No instructions to aircraft and vehicles on the manoeuvring area.
- German Regions are Federal States and have oversight of many aviation functions e.g. licensing, airspace rules etc, although they usually follow DFS precedents and guidance.
- Non-radio traffic is allowed in RMZs/TMZs/CTRs subject to LoAs with local ATS units.
- No VFR transponder requirements below 5,000ft and outside TMZs.
- Transponder required in all Class D airspace except CTRs.
- General exemption for gliders below FL100.
- Transponder required by all aircraft above FL100. Except for gliders operating within 'wave windows', which are segregated from airspaces operating under Federal rules. These windows are not displayed on VFR charts. No transponder requirement within these windows.
- Where there is a transponder requirement, it shall be a Mode S transponder.
- All German ATS units have a 121.5 transmit/receive facility and Sectors/FIS positions are mandated to monitor the frequency. Emergency communications are generally initiated on the frequency in use at the time and transferred to 121.5 only as necessary. It was noted that the hosting DFS Supervisor had never experienced an emergency call on 121.5 in 20 years of service.
- In Germany the Aerodrome controller is responsible for traffic in the CTR and the Radar/Approach controller is responsible for traffic in the CTA above.
- DFS only records an infringer if it results in a safety incident. In 2017 they had 184 infringements of regulated airspace (not Class E).
- Recognising the need to deploy the ACAS 'Safety Net' throughout Class E airspace, the German State is considering this year whether to extend transponder requirements to more areas.
- There are no VFR/IFR separation standards in Class D CTRs/CTAs but in practice DFS controllers use Class C traffic avoidance techniques because of the limited ability of IFR CAT to 'see & avoid'.
- German GA community does not understand the need for EU Commission proposals for an 'En-route IFR' pilot rating.
- All 1:500,000 charts are published in hard copy once a year on the same March AIRAC date as most airspace changes are implemented. The 1:250,000 charts depicting terminal airspace are published as part of the VFR AIP in the same cycle. The German State publishes both an IFR and VFR AIP.

5. Summary

- 5.1 The day highlighted some key themes on how German airspace is managed. Firstly Germany has an airspace change process which seems to be highly streamlined, with user engagement at regular time periods, and implementation occurring mostly at the same time every year. DFS is the sole En-route ATSP and, with the exception of smaller regional airports, it provides ATS for most of the German airports and has supervisory authority for all German ATS. As such it appears reasonable for the German State to delegate to DFS the responsibility for, and the management of, the change process. This allows DFS to undertake a holistic approach to all airspace change, which is welcomed by users.
- 5.2 Secondly the introduction of a centralised FIS using surveillance appears to have rationalised services and has reduced both the number of German classified safety events and the workload of both GA pilots and ATC staff. The service is free to the user and is funded by the en-route charge.
- 5.3 Thirdly, the size of German CTRs appear to meet the German State airspace containment requirements and no issues were apparent.
- 5.4 Fourthly the German regulations for FUA of CAS for segregated glider activities appear to work well. Tactical arrangements for activation/de-activation of the Gliding Sectors have been utilised.

Annex A Meeting attendees and Agenda

DFS Mathias Swoboda CC/O; Hd of Operational ATM Systems & Engineering
 DFS Gunnar Strobel – OA/D; Airspace Design
 DFS Daniel Müller – NL Mitte; SV FVK
 NATS Andy Edmunds, Future Airspace & ATM
 NATS Jonathan Smith, CAA Secondee
 NATS Stuart Jackson-Smith, Prestwick Centre Airspace Consultant
 UK CAA Dave Drake, Airspace Policy Lead
 FASVIG John Brady, GA lead
 FASVIG Steve Green, GA Lead
 GA German rep Günter Bertram

No.	Time	Topic	Responsible
0.	11.00	Welcome	CC/O Mathias Swoboda
1.	11.05	Questions/themes from the team UK Presentation Airspace regulations and accessibility for the GA	Mathias Swoboda OA/D Gunnar Strobel
2.	12.30	Lunch Break	
3.	13.30	Operational handling	NL Mitte Daniel Müller (SV)
4.	15.00	Conclusion	Mathias Swoboda
5.	16.00	End of Meeting	

Annex B German Government criteria for the type of airspace around an airport.¹

Category	IFR Departures/Arrivals per year	Potential Airspace Structures All airspace Class C above FL100
1	< 10,000	<ul style="list-style-type: none"> • Class D CTR, Class E above to FL100, or • RMZ, Class E above to FL100
2	approx. 10,000 – 30,000	<ul style="list-style-type: none"> • Class D CTR, TMZ and/or RMZ above and Class E to FL100 • RMZ
3	approx. 30,000 – 50,000	<ul style="list-style-type: none"> • Class D CTR, Class D CTA up to FL60/FL100, or • Class D CTR, Class D CTA up to FL60, TMZ and/or RMZ from FL60 to FL100
4	approx. 50,000 – 100,000	<ul style="list-style-type: none"> • Class D CTR, Class C CTA up to FL60, Class D CTA to FL100, or • Class D CTR, Class C CTA up to FL60, TMZ and/or RMZ FL60 to FL100
5	approx. 100,000 – 150,000	<ul style="list-style-type: none"> • Class D CTR, Class C CTA up to FL60, Class D CTA to FL100
6	> 150,000	<ul style="list-style-type: none"> • Class D CTR, Class C CTA up to FL00

¹ Catalogue of Criteria of the Federal Ministry of Transport and Digital Infrastructure for the Establishment of Airspaces - Airspace Concept Germany - (Version 5.0)