British Gliding Association Airspace Change Proposal – CAP1616 Design Principles

Introduction Purpose of this Document

Submission was made to the Civil Aviation Authority (CAA) identifying the issues raised in the Statement of Need (below) by the British Gliding Association (BGA) in April 2018. The CAA agreed that the BGA should take this forward as a formal Airspace Change Proposal (ACP) under the current CAP1616 procedure. In line with that process the ACP is now at the Define stage.

The purpose of this document is to engage with the major stakeholders impacted by the ACP to establish the design principles that should be applied to any resulting proposal(s).

Background to Gliding

This section is included to ensure that there is a common understanding of gliding in general and of cross-country flying.

There have been over twenty UK gliding world champions between 1952 and 2018. Whilst local soaring for members and providing gliding experiences for visitors are facets of a gliding club's work, the major portion is to develop current and new pilots to emulate or better these performances. The goal of all these glider pilots is to fly cross-country.

The principles of gliding are simple. The pilot is flying an aircraft that is constantly descending and utilises rising air, whether from thermals, ridges or lee-wave, to remain airborne. At any time, a glider is around ten minutes away from a potential landing unless the pilot can find rising air to climb. The concentration required to utilise rising air and, at the same time, maintain constant look out at the surrounding sky for other aircraft cannot be underestimated.

Gliding is a technically demanding, environmentally friendly, mentally challenging air sport. It is recognised as a pathway to careers in the UK aviation and aerospace sectors and is a significant part of General Aviation's (GA's) overall economic contribution to the UK.

In 2017, there were over 72,250 movements at the clubs in the region covered by this ACP.

Cross-country flying may be informal and relatively short or formally declared long-distance tasks for which the start, finish and turning points are predefined and which are selected from the formal published list of gliding waypoints. The aim is for the pilot to use their skills in airmanship, the use of rising air (and recognising its sources) and navigational techniques to complete the task.

Experienced glider pilots achieve flights covering hundreds of kilometres (some over 1000 km) and lasting many hours. "Out and return" flights in excess of 500 km (occasionally 750 km) are regularly achieved from the clubs based in the region covered by this ACP.

Competitive pilots fly in races around pre-defined courses. These gliding competitions test pilots' abilities to make best use of local weather conditions as well as their flying skills. Local and national competitions are organized in the UK (and around the world). Techniques to maximise a

glider's speed around the day's task in a competition have been developed, including understanding the optimum speed to fly, navigation using GPS and sophisticated avionics, and the carrying of water ballast to improve performance. If the weather deteriorates during any cross-country flight pilots may need to land elsewhere, often in fields. This is an accepted aspect of cross-country flying.

In addition to GPS, flight computers and accurate, up-to-date moving maps (showing controlled airspace and NOTAMs relevant to the task route), gliders flying cross-country will be equipped with radios and many will also be fitted with Mode S transponders. In addition, they will be fitted with the FLARM conspicuity aid which advises the pilot of the location of any other aircraft similarly fitted.

Two cross-country competitions of national importance are run each year from clubs based in the region with at least one other competition of the type which moves around the gliding community being based in the region each year. In addition, each of the region's clubs have annual cross-country task weeks. Individual cross-country flights are carried out every day throughout the year when conditions allow.

Statement of Need

Due to airspace restrictions to the north, the Pennines to the west and the sea to the east, crosscountry gliding flights from northern clubs are usually tasked to the south/south west. As stated, all gliders flying cross-country tasks are radio-equipped and an increasing number are fitted with Mode S transponders and pilots can, and do, when appropriate, request clearances to enter or cross the Class D Controlled Airspace (CAS) in the region. Whilst two of the region's three airports do give clearances (the third historically does not), when clearances are requested refusals do occur even to transponder equipped gliders. Also, because of the difficulties of communicating whilst maintaining a level or flying a clearance accurately the preference is to avoid entering CAS if possible.

The Class D CAS in the area is complex. At each airport it is made up of Control Zones (CTRs) in the immediate vicinity of the airport, extending from the surface to a specified upper limit, surrounded by a number of Control Areas (CTAs) which are placed between the CTRs and nearby airways to give uninterrupted controlled airspace to airways arrivals and departures. These airspace constructs have become increasingly complex. The latest Leeds Bradford Airport (LBA) ACP proposes three CTRs and fifteen CTAs each of the latter having different upper and lower limits (some defined in heights above sea level, some in Flight Levels and some varying dependent on the time of day) and dimensions. These complexities further increase the navigation workload and encourage "head in cockpit" flying if a crossing is to be attempted.

Gliding (and other GA and military) traffic that is refused a clearance, does not want to because of the workload implications or cannot operate in Class D has no choice but to go around it. This produces significant funnelling to the east of the Doncaster Sheffield Airport (DSA) Class D CAS (an area not conducive to gliding flight because of the damp, low-lying land and the effect of the sea breeze), forcing traffic into a narrow corridor between the Class D and the permanent D313 Red Arrows practice area and Lincolnshire MATZ clutch. To the west, traffic is forced into the

narrow (and shallow) corridor between LBA and DSA Class D. This funnelling significantly increases the probability of conflict both to the east and west of DSA Class D.

Part of the original justification for the region's Class D CAS (at DSA, LBA and Durham and Tees Valley Airport (DTVA)) was based on forecast increases in passenger numbers (PAX) and commercial air transport (CAT) movements. Those forecasts have never materialised. Indeed, in one case there has been a continuous decline in both PAX and CAT over the last 10 year. These forecasts continue to be used as part of the justification for more recent ACPs seeking to add to the Class D CAS. (See Appendix A).

The net result is that glider pilots are forced to avoid large tracts of Class D which have traffic levels far lower than the areas they are forced in to. Over a busy area for aviation stretching from Huddersfield in the west to Grimsby in the east and from Teesside in the north to the East Midlands CTR in the south, pilots of GA aircraft, including gliders, should be "aviating and navigating" rather than "communicating" the administrative arrangements needed to enter an area which has a traffic density much lower the one they are leaving.

A stated aim for the introduction of Class D CAS in the region was "to achieve an appropriate airspace configuration that was mutually acceptable to all parties whilst assuring effective air traffic management throughout". This it has singularly failed to achieve. Because of the funnelling effect around and below Class D the risk of conflict is significantly increased outside it as is evidenced from the responses from the gliding and GA communities to the DSA ACP Post Implementation Review (PIR) and the various ACP consultations which have been, and continue to be, submitted.

Purpose of this ACP

The stated purpose, as accepted by the CAA, of this ACP is to address the issues above by providing an airspace configuration, proportionate to need, providing the flexibility of access, transit and movement whilst also improving safety for all airspace users (both within and outwith CAS) in the region bounded by DTVA to the north, DSA to the south and east and LBA to the west.

It is recognised that the existing Class D CAS in the region was constructed in accordance with ICAO design principles and that, at the time, CAA interpretation of these principles required all departure, arrival and holding patterns to be contained within controlled airspace

It is also recognised that the Class D CAS contains Noise Preferential Routes (NPRs) which have been confirmed as acceptable to the local community, is compatible with the existing airways structure and, that it provides a known air traffic environment for CAT movements including Standard Instrument Departure (SID), Standard Arrival (STAR) procedures and Instrument Approach Procedures (IAPs).

Meeting those requirements must continue to be a fundamental principle of any proposed changes to the airspace configuration. However, the CAA's interpretation of the ICAO design

principles is not as it was when the airspace was established. Containment is no longer deemed essential. The establishment of SIDs (and STARs/IAPs) outside CAS is now considered by the CAA on a case by case basis. The move to Performance Based Navigation (PBN) enables more accurate flying and combined with the performance of modern CAT aircraft should reduce, rather than increase, the amount of CAS needed.

The airspace developer's "toolbox" today is equipped with a much more varied set of "tools" than previously. Combinations of these should be used to address the issues identified above, provided of course, that there is a willingness across the aviation community in the region to do so.

Before further Class D is established in the region as is being requested in a number of ongoing ACPs it is proposed that the opportunity is taken to review the region's airspace in general and its Class D CAS in particular through the lens provided by the tools now available and to use those tools to provide a solution that is truly proportionate to need, mutually acceptable and improves safety for all. Class D is not the only way to provide protection for CAT and create a known traffic environment.

Design Principles

Since the implementation of the region's Class D CAS, airspace policy and airspace design tools have developed and evolved, significantly shifting the landscape from when the CAS was originally implemented. For example in accordance with the Department for Transport's (DfT) General Aviation Strategy, 26 March 2015, the Future Airspace Strategy VFR Implementation Programme has set out packages of change looking to ensure the GA sector (including gliding) realises some benefits, including that "the importance of VFR operations is understood and recognised in airspace policy and decision making…and controlled and regulated airspace is rebalanced to reflect the needs of both VFR and Instrument Flight Rules (IFR) operations".

CAA policy is that CTRs should be either Class A or D CAS; however, the airspace of CTAs should be that of the least restrictive classification unless a clear safety need is demonstrated, therefore appropriate reclassification of the region's Class D CTAs must be considered.

In the first instance, each CTA should be reviewed to confirm or otherwise its necessity and, where need is proven, that its dimensions and classification are the least required to meet that need. The full range of options should be looked at including but not restricted to the following:

- revert to Class G;
- reclassify to Class E;
- both of the above supported by any/all of Radio Mandatory Zone (RMZ)/Transponder Mandatory Zone (TMZ)/listening out squawk/frequency";
- controlled use of flexible/shared airspace.

In addition, a review of the current plethora of Letters of Agreement (LoA) between individual airports and individual GA clubs which may or may not be relevant in any resulting redesigned airspace should be carried out.

The ACP sponsor proposes that any changes resulting will meet the design principles laid out in the table below.

Draft Design Principles

	Principle	Priority	Agree Yes No Partial	Main Comments Received	Final Principle	Rationale
1.	Must achieve appropriate and acceptable levels of flight safety for all airspace users in the region.	1	Y	Safety compliance will be the overriding principle for any design option(s). (DSA/DTVA) Must take account of flight safety in the proximity of as well as within the CAS (GA community stakeholders) Accountability for safety must be considered when determining impact to change (DSA/DTVA/LBA) Any proposed change must meet the requirements of the airports' Safety Management System(s) in order to be acceptable to the accountable Safety Manager (DSA/DTVA)	Must achieve appropriate and acceptable levels of flight safety for all airspace users (including commercial, GA and military) in the region and must take account of safety outwith as well as within CAS	Principle modified to cover safety outside CAS. Accountability for safety will be addressed in any proposal(s) going forward. Any proposal resulting from this ACP will be aligned with the appropriate safety regulations. The specific request to meet airports' SMS requirements will be addressed as proposals develop. Any design must maintain or improve the current level of safety

2.	Must meet current regulatory requirement and be technically flyable by all aircraft types	1	Y	Technical compliance will be aligned with national and international airspace legislation, policies and strategies (GA and Airports)	Must meet current (and proposed) regulatory requirement and be technically flyable by all aircraft types	Modified to reflect feedback from NATS Prestwick Centre
				The EASA regulatory draft proposals on airspace design, inclusive of containment within CAS are required to be taken into account.(NATS Prestwick Centre)		

3.	Must facilitate existing operational safety, performance and capacity parameters	2	Y	Current operational safety, performance and capacity will be maintained. (all) The proposed design must maintain or improve operational resilience of commercial air traffic operations.(NATS) The proposed design must be technically flyable and maintain or improve existing operational performance and capacity. (NATS/DSA/DTVA) Any airspace designs must be compatible with all existing IFPs at LBA and must maintain or improve existing operational safety, performance and capacity (LBA)	Must maintain or improve existing operational safety, resilience, performance and capacity parameters	Modified to reflect feedback from NATS Prestwick Centre

4.	Must be compatible with the existing airways structure	2	P	Compatibility with the existing airways structure will be maintained (all) Must be able to integrate with the aims of the Airspace Modernisation Strategy (LBA)	Must be compatible with the existing airways structure and proposed airways structure	Modified to reflect LBA's comment regarding the AMS
5.	Must provide a known air traffic environment for CAT movements where required	1	P	Will provided a known traffic environment for CAT movements where required in accordance with current legislation and policies (all) The Air Traffic Management system must be adequate to ensure that prescribed separation can be maintained between aircraft within the airspace structure and safe management of interfaces with other airspace structures (comment from LBA)	Must provide a known air traffic environment for CAT movements where required	Not changed

6.	Must ensure that established and accepted Noise Preferential Routes (NPRs) are maintained	2	Y	Established and accepted NPRs will be maintained by any resulting airspace design changes (all) It is recognised that the airports are answerable to their local communities for any resulting impact on the	Must ensure that established and accepted Noise Preferential Routes (NPRs) are maintained	Not changed
				environment of changes made (DSA/DTVA) This would be a high priority to any design affecting LBA (LBA)		

7.	Must take account of the commercial needs of the region's airports and the airline operators using them	2	Y	The commercial needs of the region's airports and their airline operators will be recognised but they must be realistic and regularly verified (all) Noted that there is also the requirement to comply with regulatory requirements for the safe provision of ATS as set out by EASA or the CAA. These may be at odds with the risk appetite of a private individual. (NATS Prestwick Centre) Given the economic contribution of commercial aviation to the regional and national economies this would be deemed high priority (LBA)	Must take account of the commercial needs of the region's airports and the airline operators using them	Not changed

8.	Must ensure environmental impact is unchanged from the current level	2	P	Will ensure current level of environmental impact is maintained or improved..(all) The overarching aim of new technologies is to reduce the environmental impact associated with aviation. The status quo is therefore not the appropriate principle to be applied. (NATS Prestwick Centre) Agree with the NATS comments (LBA)	Must ensure environmental impact is unchanged or improved from the current level	Modified to include "improved"

9.	Must ensure that where controlled airspace is required it is of the minimum dimensions needed to meet design principles 1. To 8. above	2	P	Where controlled airspace is required it will be of the minimum dimensions needed to meet design principles 1. To 8. Above (GA respondees) There needs to be a balance of size and complexity to reduce the risk of infringement and keep people safe but without introducing CAS for no tangible safety advantage (NATS) The airspace structure must be of sufficient dimensions with regard to expected aircraft	Must ensure that where controlled airspace is required it is of the minimum dimensions needed to meet design principles 1. To 8. above	Unchanged

				navigation performance and manoeuvrability to fully contain horizontal and vertical flight activity in both radar and nonradar environments. Any airspace must also provide containment of any Instrument Flight Procedures in accordance with ICAO PANS-OPS Doc 8168 (LBA) Any airspace designs must be compatible with all existing IFPs at (LBA)		

10	Must ensure that where controlled airspace is required it is of the lowest classification needed to meet design principles 1. To 8. above	2	P	Where controlled airspace is required it will be of the lowest classification needed to meet design principles 1. To 8. Above (GA respondees – NATS partial) The Air Traffic Management system must be adequate to ensure that prescribed separation can be maintained between aircraft within the airspace structure and safe management of interfaces with other airspace structure (LBA) The only way to maintain current levels of safety is for	Must ensure that where controlled airspace is required it is of the lowest classification needed to meet design principles 1. To 8. above	Unchanged

				ATC to have positive control over all traffic within the airspace (LBA)		

11	Minimise the impact of noise up to 7000' above ground level	3	Y		Minimise the impact of noise up to 7000' above ground level	Unchanged
12	Avoid exposing new communities to aircraft noise	3	Y		Avoid exposing new communities to aircraft noise	Unchanged
13	Reduce fuel burn and carbon emissions where possible	3	Y		Reduce fuel burn and carbon emissions where possible	Unchanged
14	Do not overfly communities with departures that are already overflown regularly by arrivals	3	P		Do not overfly communities with departures that are already overflown regularly by arrivals	Unchanged
15	Minimise the need for vectoring to ensure predictability of aircraft tracks	3	P		Minimise the need for vectoring to ensure predictability of aircraft tracks	Unchanged

The last five principles have been added at the request of airports' representatives. They are included in the table as they provide a valuable additional "checklist". As has been stated elsewhere, it is not the intention of this ACP to change any current CAT routings.

APPENDIX A

Airport Growth Forecasts

DSA

In its original airspace proposal, DSA predicted PAX at 2 million by 2007 and to 4 million by 2010. The actual numbers achieved were less than 1 million by 2007, 840,000 in 2009, 690,000 in 2013 recovering to only 1.3 million in 2017. Numbers for 2018 (to end August) show that PAX is down by 8% and CAT down by 11% compared to the same point last year.

Future forecasts have taken no account of the "fragile" financial situation of one of DSA's key operators or the potential reduction of eastern European migrant traffic (a major part of DSA operations), post Brexit. There is therefore no reason to believe that future forecasts are any more robust than those used to justify DSA's original ACP.

LBA

In its original and subsequent requests for additional Class D CAS, LBA has predicted large increases in PAX and CAT. Whilst there has been an increase in PAX from 2.8 million in 2006 to 3.6 million in 2016; CAA statistics show that over the same period there has been a year-on-year decline in CAT movements from 37,000 in 2006 to 34,000 in 2017. Total aircraft movements at the airport over the same period fell from 67,000 in 2006 to 46,000 in 2017. Numbers for 2018 (to end August) show that PAX is down by 4.5% and CAT down by 8% compared to the same point last year.

LBA's *'Route to 2030'* strategy document, used as part of the justification for the latest LBA ACP, predicts increases in CAT movements from 37,000 in 2020/21 to more than 60,000 in 2030/31 and PAX from 3.6 million to 7.1 million over the same period. These predictions are based on 'high-end' forecasts provided by the Department for Transport in its 2017 published Aviation Forecasts. The forecasts (relevant to LBA's strategy) included in this document are unchanged from the previous (2013) edition which is five years old and assumes far higher levels of national economic growth than those currently being achieved. Moreover, against a post Brexit background of economic uncertainty and the current turmoil within the airline industry, the validity of those predictions is highly questionable. The recent difficulties experienced by three airlines out of LBA are indicative of the uncertainties facing the airline industry and the need for caution in predicting future expansions of passenger numbers.

It is the opinion of the commercial air transport experts we have consulted and regular users of the airport that the size of the current LBA terminal building could not cater for this increase in passengers, as it is already above capacity. In addition, aircraft movements are restricted by the length of the runway and the absence of a parallel taxiway forcing aircraft to 'back track' along the runway, thus obstructing both take-offs and landings and limiting the capacity for increasing flight numbers. *While 'Route to 2030'* proposes a small increase in terminal size the timescale is unclear and is expressed only *"as and when required".*

'Route to 2030' also asserts that LBA's route development objectives can be achieved without an extension to the runway or the construction of a parallel taxiway and that, with enhancement to the existing navigation infrastructure, the runway offers sufficient length to serve both short and long-haul destinations. Whilst there are long term plans to extend the existing taxiway loops (by 2030) they will only partially alleviate the backtracking problem. It is the opinion of our consultees that only a full parallel taxiway will allow a significant increase in the number of aircraft movements at LBA.

DTVA

DTVA has seen a steady decline in PAX and CAT movements over the last 12 years. From a peak in 2006 of 900,000 PAX and 12,500 CAT to an end of 2017 position of 131,000 PAX and 4,000 CAT. Over the same period total aircraft movements have dropped from 57,500 to 19,500. DTVA's own 2014 strategy document predicts and plans for this decline in numbers but makes no mention of removing unused Class D CAS.

APPENDIX B

BGA ACP Design Principles – Stakeholder List

Stakeholder

Leeds Bradford Airport (LBA)

Durham Tees Valley Airport (DTVA)

Doncaster Sheffield Airport (DSA)

Leeds East Airport

Humberside Airport

Retford (Gamston) Airport

RAF Linton-on-Ouse

RAF Leeming

NATS Prestwick Centre

Sherburn Aero Club/ Sherburn-in-Elmet Airfield

Sheffield Aero Club

Humber Flying Club

York Flying School (Breighton)

Burn Gliding Club

Darlton Gliding Club

Derbyshire and Lancashire Gliding Club (Camp Hill)

Wold Gliding Club (Pocklington)

York Gliding Centre (Rufforth)

Yorkshire Gliding Club (Sutton Bank)

British Hang Gliding and Paragliding Association (representing the clubs in the region)

All members of Regional Airspace User Working Group (RAUWG).