

# **BRISTOL (EGGD) VMATS PART 2**

**EGGD** 

REVISION 2024/10 - EFFECTIVE 3 OCTOBER 2024

### **PRE**

Effective 3 October 2024

## **DISTRIBUTION AND SCOPE**

This manual is for controllers of Bristol Aerodrome Control (ADC) and Approach Control (APC) positions, containing specific and local procedures relevant to these positions. Controllers must be familiar with controlling procedures in the UK; this manual should be read in conjunction with MATS Part 1 (CAP 493) and guidance on standard UK radiotelephony phraseology, detailed in CAP 413.

## **EXCLUSION OF LIABILITY**

This manual is for use on the VATSIM Network only and should never be adopted for real world use.

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## **ACKNOWLEDGEMENTS**

This document has been written and proofread by a huge wealth of people, without which the development of this document would not have been possible. On behalf of all VATSIM UK's members, this acts as an acknowledgement and thanks for their work.

## **DEFINITIONS**

The key words "SHALL", "IS TO", "ARE TO", "MUST", "SHOULD", "MAY" are to be interpreted as described in MATS Part 1 (CAP 493).



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## **MARKED CHANGES**

Changes made since the last release are marked with a black bar, as indicated, in the left-hand margin. They are also described briefly in the table below.

## **AMENDMENT HISTORY**

Revision	Effective Date	Notes
2024/10	3 October 2024	Removed references to 'Cul-De-Sac' and replaced with 'Link C' ( $\underline{ADC}$ $\underline{1.4}$ )
2024/08	8 August 2024	Fixed wing VFR arrival procedures updated (GEN 3.3.2); Fixed wing VFR transit procedures updated (GEN 3.3.3); Updated wording to reflect the addition of Bristol Ground to the AIP (ADC 1.2); Cardiff CTA delegation diagram corrected (APC 1.2.4) Updated coordination requirements for VFR arrivals (APC 2.2.2)
2024/06	13 June 2024	Corrected to 'westbound' for traffic planning via CONKO being worked by Bristol (APC 2.7.4); Change to release conditions for traffic routing via EXMOR with Cardiff APC (APC 4.2.1); Change to inbound agreement from AC West for traffic via ICTAM (APC 4.1); Corrected references to YORQI for runway 27 SIDs (APC 5.1); Addition of agreement between Bristol and AC West for Cardiff LEKCI traffic (APC 5.6); Addition of agreement with Cardiff APC for handling LEKCI departures (APC 5.8.2); Changes to Cotswold CTA 12 delegation and airspace delegation from London to Bristol (APC 1.2.4); Frequencies updated to 8.33 (GEN 7.2)
2023/09	8 September 2023	Stands 31R and 33L removed (ADC 2.3).
2023/03	23 March 2023	MSL/Transition table amended to match UK formatting (GEN 1.5); Added Departure warnings to AC West (ADC 2.6); Updated speed table to UK harmonized table (SEP 2.3); AIRAC change of HAWFA/YORQI SIDs replacing BADIM/WOTAN (ADC 3.4); New STARs introduced with LD 1.1 airspace deployment (APC 1.3); New delegated airspace introduced with LD 1.1 (APC Chapter 1); Addition of deemed coordination of traffic at cruise within delegated airspace, in line with London vMATS (APC 2.7); Procedures for Gloucester/Oxford flights joining ATS routes via delegated airspace (APC 2.7); Updated Final approach separation requirements in line with UK procedures (APC 3.5); Inbound procedures changed for all arrivals (APC Chapter 4); Change to outbound agreements with AC West (APC 5.6)
2021/12	2 December 2021	Updated STARs; Helicopter procedures added; East apron and stand changes; Expanded ADC and APC procedures; New diagrams; Editorial and formatting changes



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7	18 June 2020	Added Bristol Director; Added new agreements in absence of Cardiff APC; Removes GMC responsibility for south apron; Added new EXMOR-Burnham line (Burnham Box); Added & updated new/existing stands & limitations; Removes references to Bristol DHZ; Withdrawal of SRA procedure; Withdrawal of LARS APC split; Amendment of departure intervals; Added reference to listening squawk; Various editorial & layout changes
6	31 March 2015	Addition of RNAV Procedures; Aerodrome Surface Operations; Addition of interpretation of words; Adjacent Aerodromes; Addition of Glossary of Terms; Interpretation of Words; Departure Interval Table; Update to Appendices
5	2 July 2012	Altimeter Setting Procedures; Light Aircraft and Helicopter Procedures; All Weather Operations; Aerodrome Control – General Aerodrome Operations; Aerodrome Surface Operations; Letters of Agreement
4	10 March 2011	Light Aircraft and Helicopter Procedures; All Weather Operations; Coordination with Adjacent Aerodromes
3	27 May 2010	Altimeter Setting Procedures; Coordination with Adjacent Aerodromes; Special Separation Standards IFR; Aerodrome Operations; Aerodrome Surface Operations; Procedures for IFR traffic; Approach Radar Control; Area Control; Letters of Agreement
2	1 January 2010	Light Aircraft and Helicopter procedures; Low Visibility Procedures; Ground Movement Control; Coordination with adjacent aerodromes; Co-ordination; SSR operating instructions
1A	23 November 2009	Special Categories of flight; Coordination with adjacent aerodromes; Aerodrome General; Aerodrome Operations
1	30 June 2009	First Publication



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## INTRODUCTION AND STRUCTURE

The Bristol virtual Manual of Air Traffic Services (vMATS) Part 2 is complementary to the MATS Part 1 (CAP 493). Together, these two documents provide comprehensive instructions and information for ATS controllers within VATSIM UK.

This vMATS has been divided into separate sections for ease of reference, each with its own three letter identification code.

This document is divided into sections as follows:

Page Abbreviation Section

PRE Preface

GEN Unit General Operating Procedures

SEP Local Separation Standards

ADC Aerodrome Control

APC Approach Control

## **TIME REFERENCES**

All time references within this document are Coordinated Universal Time (UTC), or Zulu time, unless otherwise specified.

The UK observes daylight saving time in the summer months (British Summer Time, or BST), so the clocks shift forwards by one (1) hour. In summer therefore, UK local time is one hour ahead of UTC/Zulu time.

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## **GEN | UNIT GENERAL OPERATING PROCEDURES**

## **Chapter 1** Altimeter Setting Procedures

In addition to the procedures in MATS Part 1, Section 1, Chapter 6, the following will apply to aircraft within the Bristol CTR/CTA and ATZ.

#### 1.1 Departing Aircraft

All aircraft departing, remaining within the circuit, or operating within the Bristol CTR/CTA, shall be provided with the current aerodrome QNH on first contact. Any aircraft may request to operate on the aerodrome QFE, and this should be provided upon request. Once the aircraft has left the Bristol CTR/CTA they should be passed the appropriate Regional Pressure Setting.

#### 1.2 Arriving and Transit Aircraft

Aircraft transiting through the Bristol CTR/CTA, at or below the transition level, are to operate on the aerodrome QNH. Aircraft operating outside controlled airspace should be passed the appropriate Regional Pressure Setting.

#### 1.3 Aerodrome QFE

The QFE for the aerodrome can be calculated by subtracting 22 hPa from the aerodrome QNH.

#### 1.4 Transition Altitude

The Transition Altitude for Bristol Airport is 6000 ft AMSL. This applies throughout the entire Bristol CTR/CTA and within the adjacent Cardiff, Cotswold and Severn CTAs.

**Note:** From here on, unless otherwise specified, vertical references measured in feet (ft) are to be assumed as altitudes AMSL.

#### 1.5 Transition and Minimum Stack Level

Both Cardiff Radar and Bristol Radar must agree on the Transition Level and Minimum Stack Level at every QNH change based on the lower of the two unit's QNHs. The Transition Level (TL) and MSL are determined by reference to the following table:

Lowest Unit QNH (hPa)	Transition Level (TL)	Minimum Stack Level (MSL)
1032 – 1049	FL65	FL70
1014 – 1031	FL70	FL70
995 – 1013	FL75	FL80
977 – 994	FL80	FL80
959 – 976	FL85	FL90
940 – 958	FL90	FL90

**Note 1:** The classification of 1013 hPa as 'low pressure' aligns with MATS Part 1.

**Note 2:** When the QNH is 1050 hPa or greater that MSL shall remain at FL70.



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#### 1.6 Altimeter Setting Region (ASR)

Bristol is situated within the boundaries of multiple Altimeter Setting Regions (ASRs). Depending on the direction of flight, the Regional Pressure Setting (RPS) for the following regions (as depicted in the chart at eAIP ENR 6-18) should be used.

North/North-west: CotswoldSouth/South-west: Portland

West: Wessex

## **Chapter 2** Adjacent Aerodromes

#### 2.1 Cardiff Airport – EGFF

Cardiff Airport is a public use aerodrome 20 NM to the west of Bristol. Due to the close proximity of Cardiff, standing agreements with Cardiff are documented in <u>APC 4.2</u> and <u>APC 5.8</u>. Cardiff APC is a designated LARS provider.

### 2.2 Cardiff Tremorfa Heliport

Cardiff Tremorfa Heliport is an unlicensed public heliport 17 NM north-west of Bristol. The heliport lies beneath the Cardiff CTA and Cardiff APC controllers will typically provide a radar service to traffic operating to/from the heliport but does not provide a service top-down.

#### 2.3 St Athan – EGSY

St Athan is a civil airfield 27 NM to the west of Bristol, now owned by the Welsh Government. It lies within the Cardiff CTR, and a specific Local Flying Zone has been established between Cardiff and St Athan. The Cardiff APC controllers are responsible for flights to and from the aerodrome (including top-down control) and IFR inbounds to St Athan should be handled as per Cardiff inbounds.

#### 2.4 Cotswold Airport (Kemble) – EGBP

Kemble Aerodrome is a public use aerodrome 30 NM to the north-east of Bristol. It is outside controlled airspace and an AFIS is provided. The aerodrome has RNP approaches coordinated by Brize Norton APC.

#### 2.5 Colerne – EGUO

Colerne Airfield is a closed RAF airfield that lies to the east of Bristol. It lies outside of controlled airspace. It continues to host an Army barracks but no ATC is provided.

#### 2.6 RNAS Yeovilton – EGDY

RNAS Yeovilton is a naval airfield that lies 23 NM to the south of Bristol. It lies outside of the Bristol CTA and outside of controlled airspace. Yeovilton Radar is a designated LARS provider.

#### 2.7 Bristol Filton Disused Aerodrome

Bristol Filton is a disused aerodrome to the north of Bristol. The airfield closed in 2013 and was sold for housing development. In reality the aerodrome surface has been broken up by mechanical means and is unsafe for the operation of fixed wing aircraft however on VATSIM





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traffic may occasionally request to operate to/from. Bristol APC does not provide a top-down service.

#### 2.8 Clutton Hill

Clutton Hill is an unlicensed farm strip to the east of Bristol and 3 NM to the east of the Bristol CTR. Located in Class G airspace but with the Bristol CTA above it at 1500 ft. It is a working farm and has no ATC available.

#### 2.9 Keevil

Keevil is a disused military aerodrome which is now used for gliding. It lies to the south-east of the Bristol CTA and is outside controlled airspace. Powered and towed launches of gliders occur all year round.

#### 2.10 Weston Helicopter Museum

Weston Helicopter Museum is located 10 NM miles south-west of Bristol and lies underneath the Bristol CTA. It has a grass area for the arrival and departure of visiting helicopters only. No ATC is available.

## **Chapter 3** Light Aircraft and Helicopter Procedures

#### 3.1 Responsibilities

The responsibility for aircraft operating VFR with visual reference to the surface in the vicinity of the ATZ, and throughout the CTR below 2000 ft is delegated from Approach Control (APC) to the Air Controller (AIR). This is in addition to the responsibilities of the manoeuvring area of the aerodrome.

Approach Control (APC) retains responsibility of aircraft operating within the CTR above 2000 ft and within the CTA. APC is responsible for aircraft operating SVFR.

Whilst Bristol is not a designated Lower Airspace Radar Service (LARS) provider APC may, at their discretion and subject to controller workload, offer UK Flight Information Services (UK FIS) to aircraft operating within 40 NM of Bristol below FL105.

Designated LARS providers in the vicinity are:

- North-east Brize Norton APC
- East Boscombe Down APC
- South Yeovilton APC
- South-west Exeter APC
- West Cardiff APC

#### 3.2 Transfer of Responsibility

Both AIR and APC are responsible for providing traffic information to aircraft under their control. For SVFR traffic, APC retains responsibility for assuring the necessary separation within controlled airspace even when traffic is operating under the control of AIR.

The transfer of responsibility for VFR traffic between APC and AIR will occur when the aircraft concerned enters controlled airspace at or below 2000 ft (2500 ft at night), or 4000 ft





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where coordinated. SVFR traffic shall be transferred once visual with the aerodrome when operating inbound and when clear of any circuit traffic when operating outbound.

#### 3.3 Fixed Wing Aircraft

#### 3.3.1 Departure Procedures

All aircraft departing Bristol should route via one of the established visual reference points, as listed in the UK AIP. If a pilot does not indicate in their flight plan which VRP they wish to leave the CTR via, they should be asked or instructed at controller discretion according to the traffic situation. Departures on a compass track are only permitted with the approval of APC.

All departing aircraft under VFR shall squawk the Bristol conspicuity SSR code 5070. This is to facilitate TCAS operations and to indicate to APC VFR traffic within the CTR under the control of AIR.

Aircraft departing the Bristol CTR should be cleared to leave controlled airspace VFR, on track the appropriate VRP, not above altitude 2000 ft. No prior coordination is necessary, but APC must be notified when the aircraft is airborne.

Traffic requesting to operate above 2000 ft or SVFR will require individual clearance from APC and will be allocated a unique Bristol local SSR code for identification.

Practice engine failures or fan-stop by single-engine aircraft are prohibited from Runway 09.

#### 3.3.2 Arrival Procedures

No overhead joins are permitted at Bristol.

Aircraft shall call Bristol APC for CTR entry/join. The approach controller, upon receiving an entry/join request, will provide the pilot with:

- Aerodrome QNH,
- A clearance to enter controlled airspace
- A designated VRP to route via

The standard route for arrivals from the North is on track East Nailsea VRP, and from the South on track Blagdon Lake, not above 2000 ft (2500 ft at night).

Once the aircraft enters controlled airspace, APC will update the aircraft's service, ensure any relevant traffic information has been passed and transfer the aircraft to AIR.

Aircraft should be instructed to report visual with the aerodrome and, once in sight, shall be issued circuit joining instructions by the AIR controller.

Traffic requesting to operate SVFR will be retained and cleared by APC who shall coordinate with AIR and transfer once overhead the VRP.

#### 3.3.3 Transit Procedures

Aircraft transiting the CTR at or below 2000 ft are the responsibility of the AIR controller. Aircraft transiting the CTR/CTA above 2000 ft are the responsibility of the APC controller.

Aircraft wishing to transit the Bristol CTR/CTA should be issued with a unique Bristol local SSR code for identification purposes.





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The APC controller should coordinate any transits below 4000 ft with AIR to give awareness for the purposes of missed approach protection, AIR may elect to work this traffic. Aircraft may be given a routing on track, if conditions allow, otherwise restrictions can be placed upon the transit to avoid conflicting with other traffic. For example, in the event of an impending departure.

### 3.4 Rotary Wing Aircraft

The following procedures supplement those outlined in GEN 3.3 for fixed wing aircraft.

#### 3.4.1 General

Helicopters are not permitted to over-fly any part of the north side aprons.

All helicopters must depart and arrive via the runway in use.

The rotary wing circuit operates at 1300 ft AMSL or 700 ft AAL.

#### 3.4.2 Departure Procedures

Western Power Distribution (WPD) have their own apron and hangers but this is not to be used for the arrival and departure of any rotary wing aircraft.

A noise sensitive area exists immediately north of the northern aerodrome boundary, which should not be overflown below 500 ft AAL. Westerly departures should not turn north until crossing the aerodrome boundary. Easterly departures should fly runway heading until crossing the opposite threshold then turn north to follow the A38.

#### 3.4.3 Arrival Procedures

Arrivals from the north for Runway 27 should approach following the A38 road and join on a right base avoiding Felton village and the noise sensitive area to the north.

#### **Chapter 4** Noise Abatement Procedures

#### 4.1 Arrival Procedures

#### 4.1.1 General

When operating IFR, any aircraft carrying out a visual approach must not join the final approach track at an altitude of less than 2200 ft.

Additionally, unless otherwise instructed by ATC, aircraft using the ILS in IMC or VMC shall not descend below an altitude of 2200 ft before intercepting the glide path nor thereafter fly below it. Aircraft approaching without assistance from ILS or radar shall follow a descent path which will not result in its being at any time lower than the approach path which would be followed by an aircraft using the ILS glide path.

Jet aircraft and propeller driven aircraft of more than 5700 kg maximum certificated weight making visual approaches to Runway 27 shall intercept final approach track at:

- Not less than 3 NM when approaching from the north
- Not less than 4 NM when approaching from the south.





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#### 4.1.2 Continuous Decent Approaches (CDA)

Bristol takes part in the CAA initiative which aims to allow aircraft inbound to perform a continuous descent prior to intercepting the ILS glide path. APC controllers are required to pass adequate track mileage information to the pilot conducting the approach, so that they may alter their descent path as necessary to facilitate a CDA.

#### 4.2 Departure Procedures

The following Noise Preferential Routings (NPR) apply to all aircraft with a maximum certified weight of more than 5700 kg departing in both VMC and IMC.

The NPR aim to minimize the amount of noise pollution in the immediate vicinity of the aerodrome.

All Standard Instrument Departures (SIDs) incorporate the appropriate NPR.

Runway	NPR
09	Climb straight ahead to IBON DME 5.4 NM (IBTS DME 4.7 NM) to be no lower than altitude 3000 ft at this point before commencing the turn
27	Climb straight ahead to IBTS DME 5.2 NM (IBON DME 4.5 NM) to be no lower than altitude 3000 ft at this point before commencing the turn

The obligations of the NPR cease when an altitude of 4000 ft or above has been reached. Below this altitude ATC may only vector aircraft off the NPR track for reasons of safety (including but not limited to emergencies, ensuring separation or for weather avoidance).

## **Chapter 5** All Weather Operations

#### 5.1 Aerodrome Equipment

Runway 27 is suitable for Category II/III operations. This permits operators to take advantage of a suitably equipped autoland feature or heads-up-guidance system, permitting operations down to a minimum RVR of 75 m.

Runway 09 is fitted with a Category I installation only and therefore aircraft cannot perform Category II/III approaches to Runway 09.

#### 5.2 Low Visibility Procedures (LVP)

#### 5.2.1 Criteria

The aerodrome controller is to implement LVP when the reported meteorological visibility falls below 1200 metres **and/or** the cloud base reduces to 200 ft AAL and is forecast to deteriorate.

Pilots shall be informed via ATIS broadcast when LVP are in force.

If a pilot wishes to conduct a Category II/III autoland when aerodrome LVP are not in force, the pilot must be offered the same Category II/III ILS protection to enable the autoland procedure to be conducted safely.



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## 5.2.2 Use of Holding Points

Holding Points DX, FX and HX are **not** to be used when LVP are in force.

#### 5.2.3 Separation in Low Visibility

Departing aircraft are **not** to be instructed to use the runway with an arriving aircraft within 5 NM of touchdown.

## **Chapter 6** Use of Runways

#### 6.1 Preferential Runway

Runway 27 is notified as the preferential runway and should be selected when the tailwind component is less than 5 knots. However, controllers should be aware of the winds aloft, especially due to the sea breeze effect which can develop at Bristol causing a reversal of the wind direction at altitude from that observed at the surface. It is advised however, that controllers should observe the wind, and consider the predictions made in the aerodrome TAF, before considering a change in the runway in use.

Serious consideration should be given to switching operations to Runway 27 when entering Low Visibility Procedures (LVPs), to allow for aircraft to make a Category II/III approach.

Due consideration should also be given to the runways in use at other nearby airfields within the Severn Clutch due to their proximity, particularly Cardiff.

#### 6.2 Runway Change Procedures

In case of a change to the active runway, AIR shall initiate co-ordination with APC to agree a last arrival and time for the runway change. AIR shall inform APC of the intended last departure before, and the first departure after, the runway change (callsign and routing). APC will inform AIR of the first arrival after the runway change.

## **Chapter 7 Description of Aerodrome**

#### 7.1 Airfield Geographical Data

ICAO Code EGGD
Aerodrome Reference Point (ARP) Lat: 512257.61N Long: 0024308.76W

Elevation 622 ft

Magnetic Variation / Annual Change | 0.36°W (2022) / 0.20°E | Transition Altitude | 6000 ft

Minimum Safety Altitude 3000 ft (NW/SW/SE)

#### 7.2 ATC Communication Facilities

#### **Aerodrome Control (ADC)**

Callsign	Logon Callsign	Abbreviation	Frequency (MHz)
Bristol Information	EGGD_ATIS	ATIS	126.030
Bristol Ground	EGGD_GND	GMC	121.930
Bristol Tower	EGGD_TWR	AIR	133.850





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**Note:** See <u>ADC 1.2</u> for details regarding Bristol GMC.

## **Approach Control (APC)**

Callsign	Logon Callsign	Abbreviation	Frequency (MHz)
Bristol Radar	EGGD_APP	RAD	125.650
Bristol Director	EGGD_F_APP	DIR	136.080

**Note:** The combined RAD and DIR functions are referred to as Bristol APC.



## SEP LOCAL SEPARATION STANDARDS

## **Chapter 1** Separation Standards

#### 1.1 General

Except where described below, standard separation is to be provided as per MATS Part 1, Section 1, Chapter 3.

#### 1.2 Wake Turbulence Separation

Wake turbulence separation is to be provided as per MATS Part 1, Section 1, Chapter 3.

#### 1.3 Horizontal Radar Separation

Bristol APC controllers may apply reduced radar separation of 3 NM between aircraft provided that:

- Both aircraft are identified, and
- Both aircraft are within 40 NM of Bristol, and
- If greater than 3 NM, the appropriate wake turbulence separation is applied, and
- If applied against an aircraft under the control of another agency, direct voice communication is available between the controllers, and the other agency must also be approved to apply reduced radar separation.

**Note:** Cardiff APC is authorised to provide 3 NM radar separation, Exeter APC is authorised to provide 3 NM radar separation within 30 NM of Exeter, AC West may only apply 3 NM separation within the confines of the Bristol and Cardiff Area Control delegated airspace.

## **Chapter 2** Departing Aircraft

#### 2.1 General Procedures

Standard departure separation detailed in MATS Part 1 shall be replaced by a standard departure interval between aircraft departing on Bristol Standard Instrument Departures (SIDs). The responsibility for establishing the initial separation between departing aircraft is held by the AIR controller.

The separation between departing aircraft shall be achieved through the application of timed intervals between successive departures. These intervals are dependent on the departure route and aircraft speed groups as listed in the departure separation table and aircraft speed groups table.

Aircraft not included in the speed groups table, or following routes other than SIDs, must be subject to individual release by APC, as will the subsequent SID departure.

Any departure from the runway not in use shall be individually coordinated between the AIR and APC controllers, as will the subsequent departure from the runway in use.

## 2.2 Departure Intervals

Departure intervals defined in minutes are based upon full sixty seconds.

The basic departure interval for all routes is **2 minutes**.

The basic interval is to be applied between successive departures from the same speed group or when the following aircraft is one speed group slower than the leading aircraft.

The basic interval may be reduced by 1 minute when the following aircraft is two or more speed groups slower than the leading aircraft.

When the following aircraft is from a higher speed group, the basic interval shall be increased by 1 minute for each successive speed group, for example Group 2 leads vs Group 3 following is 2 + 1 = 3 minutes.

#### 2.3 Aircraft Speed Groups Table

Bristol uses the VATSIM UK harmonised speed table to categorise aircraft for departure separation. The table at time of writing is shown below – any subsequent updates to the harmonised table published via Procedure Change will apply to Bristol.

Group 4	Group 3	Group 2	Group 1
All jet aircraft except:	BAE146/Avro RJ	ATR variants	BN2P/T
- Those in Group 3	CL35/CL60	DH8A/B/C	C208
- Concorde	CRJ1/2/7/9/X	F50	DA62
<ul> <li>Military fast jets</li> </ul>	D328/J328	JS31/32/41	DHC6
	DH8D	King Air variants	E110
	E135/145	PC12	
	E50P/55P	SF34	
	P180	SW3/4	
	SB20	TBM7/8/9	
	Citations except:		
	C56X/680/68A/700/750		

Aircraft not included in Groups 1 to 4 are to be the subject of a separation agreed by the receiving radar controller.

### 2.4 Expeditious Release

The AIR controller may coordinate with APC an expeditious release, if they believe that a departure would suffer undue delay whilst awaiting the appropriate departure interval.

## **Chapter 3** Arriving Aircraft

### 3.1 Arriving Spacing

Minimum spacing between arriving IFR/SVFR aircraft shall be 3 NM in accordance with <u>SEP 1.3</u> however, typically increased spacing is required to allow for runway vacation and to facilitate departures between inbounds.



#### 3.2 Spacing in Low Visibility

During LVP the spacing between subsequent arrivals shall be increased to a minimum of 5 NM. Again, increased spacing will be required to facilitate departures.

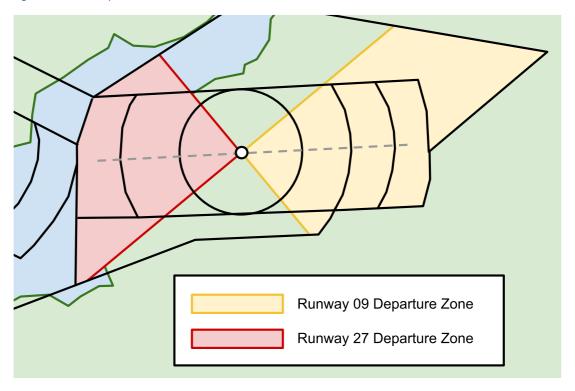
When an aircraft is carrying out an instrument approach in low visibility, there is an increased risk of a go-around. This is to be taken into account by the APC controller when applying separation and, if required to maintain separation in the event of a go-around, missed approach instructions may be passed to the pilot prior to them commencing the final approach.

#### 3.3 Departure Zones

Departure zones are established as depicted in Figure 1 and defined as:

- Runway 09 that portion of the CTR/CTA east of lines drawn at 050 and 140 degrees from the aerodrome
- Runway 27 that portion of the CTR/CTA west of lines drawn at 320 and 230 degrees from the aerodrome.

Figure 1 - Bristol Departure Zones



Within the departure zones, no inbound IFR or SVFR flight should be allowed to descend/operate below MSL without coordination. Separation between outbounds and inbounds is the responsibility of the APC controller and therefore if APC requires to descend aircraft below MSL in these areas, they must coordinate with AIR to impose an appropriate radar check.

These regions are included as part of the UK Sector File and can be found under the 'STARs' dropdown.



## **ADC | AERODROME CONTROL**

## **Chapter 1** General Procedures

#### 1.1 General Responsibilities

Aerodrome Control (ADC) is responsible for issuing information and instructions to aircraft under its control to achieve a safe, orderly, and expeditious flow of air traffic and to assist pilots in preventing collisions between:

- Aircraft flying in and in the vicinity of the control zone (CTR)
- Aircraft taking off and landing
- Aircraft moving on the apron
- Aircraft, obstructions and other aircraft on the manoeuvring area.

The responsibilities of ADC can be split between the 'tower controller' (Air Control - AIR) and the 'ground controller' (Ground Movement Control - GMC). The split of specific responsibilities between GMC and AIR is outlined in the following sections.

#### 1.2 Use of Ground Movement Planner (GMP) & Ground Movement Control (GMC)

In real life, both Bristol Delivery (GMP) and Bristol Ground (GMC) are positions that may be utilised. However, they both share the same frequency and may not be used simultaneously. The default position is Delivery; however, Ground may be opened instead when deemed necessary.

On VATSIM, controllers may elect which position they open, but must not open both simultaneously.

#### 1.3 Responsibilities

Bristol Ground (GMC - 121.930 MHz) is responsible for:

- Providing the Airfield Terminal Information Service (ATIS) when so delegated by the AIR controller
- Flight plan review with amendments as required in accordance with the UK Standard Route Document and other relevant restrictions
- Issuing departure clearances for standard IFR departures
- Control of traffic operating on the aprons and the manoeuvring area except for the runway and for the manoeuvring area south of the runway for which AIR is responsible (note: in the absence of an AIR controller GMC may extend their control to the manoeuvring area south of the runway)
- Updating the flight progress display for all aircraft under their control.
- Issuing of 'Departure Warnings' to London Area Control

Aircraft crossing the active runway **must** be transferred to the AIR controller.

#### 1.4 Manoeuvring Area Operations

Aircraft may move on the manoeuvring area and aprons only with the permission of ADC.

Outbound light aircraft must request engine start prior to taxi and aircraft parked on the apron areas are to request engine start and/or pushback from ADC.

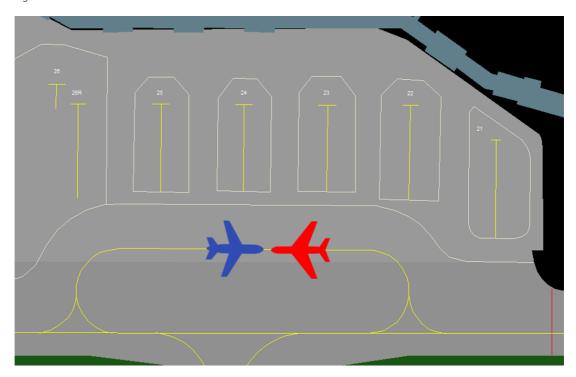
Inbound commercial aircraft will be instructed to taxi onto a parking stand allocated by ATC (allocations generated by UKCP) and inbound light aircraft are to be given directions towards the south side light aircraft parking areas.

The majority of stands at Bristol offer nose-in parking and aircraft require pushback by a tug onto the apron taxi-lane or the main taxiway. Taxiway Zulu runs west/east across the apron boundaries, with the majority of main stands pushing directly back onto the taxiway however Stands 22-26R in particular push onto Link C formed by Overflow Stands W5-8.

It is not typically necessary to instruct an aircraft to pushback in a given direction as the pushback direction is directly dependant on the runway in use. The only time a direction is required in the push back instruction is to aircraft pushing onto Link C from Stands 22-26R:

Stands 22-23: "Push and start approved onto Link Charlie face east."
Stands 24-26R: "Push and start approved onto Link Charlie to face west."





**Blue**: Location after pushback from Stands 22-23 **Red**: Location after pushback from Stands 24-26R.

Bristol only has a single main taxiway, as such it is **not** necessary to give taxiway identifiers in taxi instructions. Only the holding point and current QNH should be passed.

Example: "BAW123, taxi holding point AX/GX, QNH 1014"

Overflow Stands E1-3, W4 and W4-8 should not be confused with or referred to as taxiway identifiers.



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#### 1.5 Stand Allocation

#### 1.5.1 Routine Operations

The following stands are used in routine operations:

Stand	Maximum Aircraft Size	
1-3	A321	
4	B752	
5-6	B738/A320	
7N	B738/A321	
7-11	A320 (Note 2 for Stand 7)	
12-15	A319 (Note 2 for Stand 12)	
19-20	A321 (Note 2)	
21	E195	
22	B738/A320	
23-25	A321	
26	B789/A333	
26S	B738/A320 (Note 1 & Note 2)	
28	A321	
29	B752	
30-31	A321	
32-33	B752	
34	A321	
35	B738/A320 (Note 2)	
36	E145 (Note 2)	
37-39	A321 (Note 2)	

**Note 1:** Cannot be used at the same time as Stand 26.

Note 2: Only available on newer scenery (post 2019).

In routine operations stand allocations are typically as per UKCP assignments.

#### 1.5.2 Overflow Stands

Overflow stands are not used during routine operations as they block adjacent stands. Markings are only available on newer scenery (post 2019). For these reasons, due consideration must be given before they are used.

Stand	Maximum Aircraft Size		
E1-E3	A321		
W4-W8	A321		

For VATSIM purposes, stands E2 and W5 *may* be used for additional heavy parking if heavy stands are occupied, but at the expense of blocking other adjacent stand(s).

## 1.6 Light Aircraft Parking and South Side Operations

The south side of the airfield houses Bristol's light aircraft parking facility and is where all local flying clubs are based. Western Power Distribution helicopters are also based on the



## **ADC**

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south side (north of the Bristol Flying Club Hangar), they have their own apron for helicopter maintenance.

All operations on the light aircraft parking area must be conducted with AIR approval and all aircraft operating on the south side should be operating on the AIR frequency (except when AIR is closed in which case GMC may provide control on the southern apron and associated taxiways).

Access to the light aircraft parking area from the main runway is via Taxiways Hotel and Juliet.

### 1.7 Low Visibility Procedures

LVP are activated as per the provisions contained in GEN 5.2.

Stop bars are provided at all entry/exit points to the runway and additionally at holding points Z1, Z2, G2 and G3. This divides the aerodrome up into cells which shall be managed procedurally if the visibility drops below 900 m. Aircraft are only to be cleared into the next cell if it is completely clear of any aircraft.

If Runway 27 is in use the ADC controllers shall ensure that Category II/III protections are in place as soon as practicable after LVP have been enforced. Aircraft are to be instructed to hold at the defined Category II/III holding points in order to protect the ILS critical area.

The following holding points are designated as Category II/III holds:

- Holding Point AX
- Holding Point BX
- Holding Point JX
- Holding Point GX

Aircraft departing Runway 27 are to be held at Hold Point AX and aircraft departing Runway 09 are to be held at Holding Point GX.

Holding Points DX, FX and HX are **not** to be used when LVP are in force.

#### 1.8 Departure Warnings

Traffic joining the ATS route network **eastbound** via either HAWFA 1X / YORQI 1Z is subject to a 'departure warning' to AC West. This is to be issued by ADC at start-up/pushback.

Departure warnings may be issued either electronically via the UKCP pre-note function, via text or via voice and should include the departure aerodrome, callsign and SID.

Example: "Bristol departure warning, G-ABCD, HAWFA 1X."

## **Chapter 2** Air Control (AIR)

### 2.1 Responsibilities

Bristol Tower (AIR - 133.850 MHz) is responsible for:

Determining the runway in use



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- Providing the Airfield Terminal Information Service (ATIS) except where delegated to the GMC controller
- Issuing standard VFR clearances for traffic operating below altitude 2000 ft in accordance with GEN 3.1-3.4
- Control of the runway and the manoeuvring area south of the runway
- Issuing all landing and take-off clearances
- Obtaining releases as required for departing IFR/SVFR aircraft
- Control of the visual circuit
- Control of VFR aircraft operating within the Bristol CTR below altitude 2000 ft
- Coordination with APC
- Updating the flight progress display for all aircraft under their control.

AIR is responsible for GMC responsibilities when ADC is not split.

#### 2.2 Circuit Procedures

The visual circuit at Bristol is always conducted to the south of the airfield.

Runway 27 LEFT Hand Runway 09 RIGHT Hand

The standard fixed wing circuit operates at an altitude of 1600 ft QNH (height 1000 ft QFE) and the standard rotary wing circuit operates at an altitude of 1300 ft QNH (height 700 ft QFE).

All aircraft operating within the visual circuit should be instructed to squawk 7010.

As per the provisions in GEN 3.3.2 overhead joins are not permitted.

#### 2.3 Release Procedures

VFR departures operating below 2000 ft shall be pre-noted to APC; VFR departures operating above 2000 ft require a release from APC.IFR aircraft departing on SIDs operate free-flow provided the route separation and speed group separation outlined in <a href="SEP 2.2-2.3">SEP 2.2-2.3</a> are adhered to, except in the following circumstances where a release from APC must be obtained:

- APC has placed a 'check' instruction on a particular SID or direction of turn
- For a non-standard IFR departure (including touch-and-goes and low approaches) or SVFR departure and the subsequent departure
- For an aircraft not in the speed group table and the subsequent departure
- For an aircraft departing other than from the runway in use **and** the subsequent departure
- Following a missed approach.

Typically, the following 'checks' can be imposed by the APC controller:

- Check NORTH: BCN, HAWFA/YORQI departures
- Check SOUTH: EXMOR departures
- Check ALL: All departures





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On receipt of any 'check departure' coordination from APC, all aircraft departing in that direction are subject to individual radar release, until the 'check' coordination is cancelled.

The 'check' coordination will be carried out **before** any conflicting IFR/SVFR traffic is cleared to transit the departure zone at a level and/or route which is, in the opinion of the APC controller, in confliction with the SID tracks and levels.

At the time of carrying out any 'check' coordination, should an aircraft have already commenced its take-off run or is already airborne but not yet transferred to the approach controller, the AIR controller shall confirm that the 'check' coordination is subject to that aircraft.

#### 2.4 Transfer of Control for Standard IFR Departures

Departures may only be transferred to the appropriate frequency once all aerodrome conflictions have been resolved. Ideally transfer shall occur no later than 2000 ft or 2.5 NM from the departure end of the runway, though if required to retain traffic to resolve a confliction, the AIR controller shall look out for pilots climbing to above their initial (cleared) level and take action by reiterating the cleared level as required.

The appropriate unit for aircraft on SIDs is as follows:

Runway	BCN SID	EXMOR SID	YORQI SID	HAWFA SID
09	Bristol APC	Bristol APC	Bristol APC	-
27	Cardiff RAD	Cardiff RAD	-	Bristol APC

Bristol APC - "Bristol Radar" - 125.650 MHz Cardiff RAD - "Cardiff Radar" - 125.855 MHz

In the absence of Cardiff RAD all departures shall be transferred to Bristol APC.

In the absence of Bristol APC all departures shall be transferred to London AC West (LW - 126.075 MHz) or London AC Bandbox (L - 127.825 MHz) (AC callsign "London Control") if AC positions are band-boxed (except that if Cardiff RAD is also open BCN and EXMOR departures off Runway 27 should continue to be transferred to Cardiff RAD).

## 2.5 Non-Standard Departures

All non-standard departures (IFR and SVFR) require coordination with APC. Non-standard IFR departures joining the ATS Route Network will typically have an route clearance and separate after departure instruction which are separate to route clearance as they are determined by the local traffic situation at the time of departure.

If an aircraft is lined up on the runway or holding at a holding point and a revised clearance or after departure instructions needs to be passed, the revised clearance or after departure instructions shall be prefixed with an instruction to hold position.

Departure clearances for IFR flights shall normally be obtained from APC and acknowledged by the aircraft before it can enter the active runway. Departure is subject to release from APC and traffic shall be transferred to APC once local conflictions are resolved.



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#### 2.6 Coordination between Aerodrome/Approach Control

#### 2.6.1 Aerodrome Control with Approach Control

AIR may coordinate with APC:

- A specific minimum distance between successive arrivals
- An individual radar release of aircraft in order to expedite their departure in accordance with the procedures set out in <u>SEP 2.4</u>.

#### AIR must coordinate with APC:

- To notify APC when the circuit becomes active and when it ceases to be active, specifying whether this is the fixed wing or rotary wing circuit
- To obtain clearance VFR traffic operating above altitude 2000 ft and for nonstandard IFR and SVFR traffic
- To obtain releases as required <u>ADC 3.3</u>.

### 2.6.2 Approach Control with Aerodrome Control

APC will coordinate with AIR all IFR arrivals making any approach other than an ILS and all SVFR arrivals and transits. VFR arrival and transit traffic at or below 2000 ft is to be pre-noted to AIR. VFR transit traffic operating on the approach frequency below 4000 ft should be coordinated with AIR to protect departing traffic and missed approaches.

#### 2.7 Use of the Aerodrome Traffic Monitor

An Aerodrome Traffic Monitor (ATM) is available, and the information derived from the ATM may be used by all AIR controllers to:

- Determine the landing order, spacing and distance from touchdown of arriving aircraft
- Assist in applying longitudinal separation for departing aircraft.
- Enable controllers to confirm that the initial track of departing aircraft conforms with the clearance issued.
- Provide information to aircraft on the position of other aircraft in the circuit or carrying out an instrument approach.

#### Additionally, radar validated controllers (S3+) may utilise the ATM for advanced uses:

- Following identification, validate SSR codes of departing aircraft and verify associated mode C read-outs.
- Monitor the progress of overflying aircraft identified by Approach Radar Control to ensure that they do not conflict with the tracks of arriving or departing aircraft.
- Establish separation between departing aircraft.
- Pass traffic information.
   Establish separation in the event of a missed approach.
- Assist in taking initial corrective action when the separation between arriving aircraft becomes less than the prescribed minima.



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## **APC | APPROACH CONTROL**

### **Chapter 1 General Procedures**

#### 1.1 Sector Organisation

In this section, the following convention for the naming of the Bristol APC positions is adopted:

RAD - Bristol Radar - 125.650 MHz

DIR - Bristol Director - 136.080 MHz

APC - Combined RAD and DIR functions

The specific responsibilities of the RAD and DIR positions are outlined in the respective chapters below.

#### 1.2 Area of Responsibility

Bristol APC is responsible for the Bristol CTR and CTA.

Additionally, Area Control (AC) West delegates the Cotswold CTA-3 in addition to part of CTA-13 coincident with the lateral boundary of the Bristol CTA from the declared base of controlled airspace (DB) to FL135; plus, portions of Cotswold CTA 12 east of the buffer zone to Bristol below FL 105. Cardiff APC delegates portions of the Cardiff CTA and overlying Cotswold CTA) to the east of the buffer zone. Airspace delegated by Cardiff APC is depicted in Figure 3 and the AC delegated airspace is depicted in Figure 4.

Bristol APC shall provide approach and approach radar control services to aircraft from the time and place at which:

- Arriving aircraft are released by Area Control or Cardiff APC until control is transferred to ADC, or for aircraft inbound to Cardiff, to Cardiff APC
- Aircraft approaching from outside controlled airspace place themselves under the control of APC until control is transferred to ADC
- Overflying aircraft are within the Bristol CTR/CTA or relevant delegated airspace
- Departing aircraft are transferred from ADC until control is transferred to Area Control, or they are clear of controlled airspace and are transferred to an appropriate agency.

### 1.2.1 Bristol/Cardiff Radar Buffer Zone

A 3 NM wide radar buffer zone, extending DB-FL105, is established between Cardiff APC and Bristol APC along the common boundary between Cardiff CTA 5 and Bristol CTAs 4/5 with an extension north towards WEVBE. The buffer zone permits autonomous radar operation by both units whilst minimising coordination. Neither unit is permitted to enter the buffer zone without prior coordination with the other unit, thus ensuring that 3 NM radar horizontal separation will always exist between aircraft under the control of Bristol or Cardiff without the need for coordination.



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During eastly operations (runway 09), Bristol can request to use the buffer to facilitate arrival vectoring. During this situation, Bristol must coordinate with Cardiff to confirm their ownership of the buffer and for Cardiff to maintain 3NM separation west of the buffer.

**Note:** Aircraft operating in accordance with a standing agreement are deemed coordinated to enter the buffer zone without additional individual coordination.

The buffer zone is permanently active in a single configuration and must always be displayed on the situation display.

If an aircraft inadvertently enters the buffer zone, coordination must be effected between Cardiff and Bristol APC **without delay** to ensure separation is maintained.

#### 1.2.2 Burnham Box (EXMOR – Burnham Line)

The Burnham Box is a handover box, through which aircraft inbound to Bristol via EXMOR shall be positioned. Aircraft routing through the box must be transferred from Cardiff to Bristol at or before the handover box and are not released for left turns until east of the Buffer Zone (ie. once outside the Burnham Box).

## 1.2.3 Area Control Delegated Airspace (Cardiff APC)

AC delegates portions of the Cotswold CTA 1, CTA 11, CTA 12, Berry Head CTA 2 and areas west of this from DB-FL165 to Cardiff APC. Any traffic under the control of Bristol APC which will route through this delegated airspace shall be coordinated with Cardiff APC.

## 1.2.4 Cardiff CTA - Bristol Delegated Area

Cardiff APC delegates a portion of the Cardiff CTA (and overlying Cotswold CTA) to the east of the buffer zone (as depicted in Figure 3) to Bristol APC. Aircraft operating under the control of Bristol APC are fully released within the confines of the airspace limits shown in Figure 3.



WEVBE CLREW MOSUN Gloucester  $^{\mathsf{FIFAH}} \Delta$ AMMAN BAJJA  $\Delta$ FANFE BCN S ETNAH AXNER ICCIN OZZIL CONKO SA ASHUM SAWPE A 0 LEKCIA  $_{\rm YORQI}^{\Delta}$ BUCFA St CARWI Athan Cardiff Bristol/Cardiff Class D Airspace Burnham Box **Not Delegated Delegated to Bristol** Bristol/Cardiff Radar Buffer TIVER  $\triangle$ △ SIDHO DAWLY TOJAQ (  $\Delta$ BHD

Figure 3 - Cardiff CTA delegated to Bristol APC Figure 4 - Airspace in the vicinity of Bristol



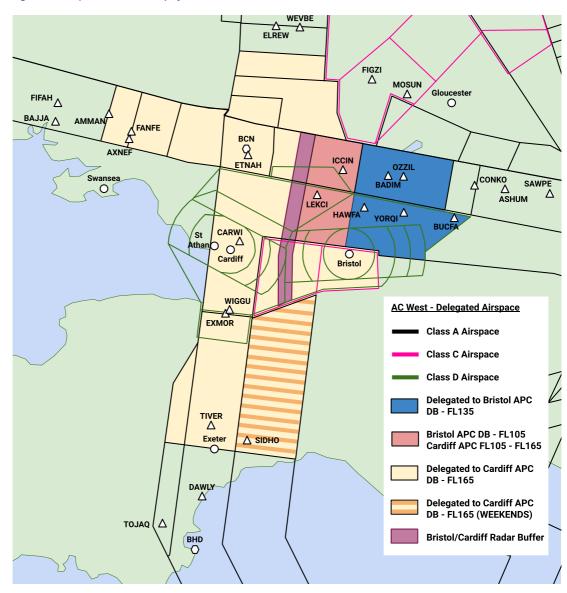


Figure 5 - Airspace in the vicinity of Bristol

#### 1.3 Standard Arrival Routes (STARs)

AC West shall transfer inbounds via CPT on the following STAR directly to Bristol APC.

STAR	Arrival Via	Route
ICTAM 1B	L179, L722, Q63, T421	ICTAM – SAWPE - ASHUM - POMAX - BRI

**Note:** Bristol APC is also responsible for the initial sequencing of Cardiff/St Athan IFR inbounds via the ICTAM 1C STAR (ICTAM – SAWPE – CONKO - OCTIZ - BRI – CDF).

Cardiff APC is (during its hours of operation) responsible for the initial sequencing of Bristol inbounds routing via the STARs listed below routing via BCN, UBCAM and EXMOR. Outside the hours of operation of Cardiff APC, AC West shall transfer inbounds directly to Bristol APC.



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STAR	Arrival Via	Route
BAJJA 1B	Q63	
DAWLY 1B (Note 1)	N864	DAWLY - EXMOR – BRI
ELREW 1B (Note 2)	-	ELREW - DIZIM - BCN - PEGZA - BRI
FIFAH 1B (Note 3)	-	FIFAH - AMMAN - BCN - PEGZA - BRI
TOJAQ 1B	P16/FRA	TOJAQ – COXPE – IZLAW – EXMOR - BRI
WEVBE 1B	N862	WEVBE - UBCAM- INGUR - BRI

**Note 1**: As all traffic on VATSIM is deemed RNAV1 compliant unless otherwise specified, this STAR will only be plannable for RNAV1 traffic cruising below FL100. Traffic shall by default be routed to TOJAQ.

**Note 2**: ELREW 1B is only for use when the N862 is unavailable due to gliding activity south of WEVBE. As such, this will not be utilised on the VATSIM network.

**Note 3**: FIFAH1B is an RNAV5 alternative to BAJJA1B. It shall only be issued upon request.

RNAV1 equipped Bristol inbounds via EXMOR requesting an RNP approach shall, following coordination with RAD, be cleared by Cardiff APC via the following STARs:

STAR	Bristol Runway	Route
ADVED 1A	09	EXMOR - ADVED
BAXUN 1A	27	EXMOR - ROTLU - BAXUN

#### 1.4 Inbound Releases

All inbound releases will be to RAD.

All standard inbounds released to Bristol APC (both Bristol and Cardiff/St Athan) by AC West or Cardiff APC will be released in accordance with the silent release procedures detailed in APC Chapter 4. It is the responsibility of Bristol APC to cancel the silent release procedures with AC/Cardiff, in good time, when it is unable to accept an aircraft in accordance with the silent release.

Aircraft that are not able to be released in accordance with these procedures shall be released by means of either a full release or, if in conflict with an overflying aircraft, a radar release. For reasons of expedition Bristol APC may request, and AC/Cardiff may offer alternative releases for aircraft that would otherwise be subject to the standard releases.

Except where agreed in a full release or radar release, following transfer of communication Bristol APC may:

- Apply or remove speed control
- Issue descent to a lower level in accordance with release procedures
- Turn and descend the aircraft after reaching the release point.

Bristol APC must not climb the aircraft or stop its descent above the release level; however, the approach controller may instruct aircraft to disregard any 'level by' restrictions imposed.



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Once traffic has entered the Bristol area of responsibility, it shall not be instructed to leave it.

#### 1.5 Information to Arriving Aircraft

After an arriving aircraft has made its initial call to APC, the following information shall be passed as soon as practicable:

- Runway in use and the type of approach, if not already received from the ATIS
- Current ATIS code
- LVP in operation, if not already received from the ATIS
- Any delay to be expected.

APC is to confirm the cleared level of an aircraft transferred from other units on first contact. If it is not volunteered by the pilot it is to be requested and verified by the receiving controller before giving any executive instruction. In addition, APC is to confirm aircraft type, including type variants. Any aircraft type which is not as filed must be changed as soon as possible and advised to any controller who may be reliant on up-to-date information, say for the provision of wake vortex separation.

Aircraft that have received the information above must be kept informed of the following until they have landed:

- Significant changes in the meteorological and runway conditions
- Relevant reports from other pilots
- Implementation of cancellation of LVP.

#### 1.6 Transfer of Data and Control between Radar Controllers

Transfer of data and control from RAD to DIR will be by electronic transfer of the aircraft track data-block coincident with the transfer of communication.

RAD is to ensure that all information on the electronic flight progress strip is accurate before transfer to DIR. When this is the case, no verbal coordination is required, unless either controller feels it necessary for reasons of clarity, or to highlight non-standard positioning or coordinated restrictions.

#### 1.7 Identification and SSR Validation and Verification Procedures

All aircraft under the control of Bristol APC must be identified, the assigned SSR code validated, and Mode C return verified. Except where described below this is to be by one of the methods described in MATS Part 1. Aircraft transferred from another radar unit either by standing agreement or individual coordination are deemed to have been validated and the Mode C return verified.

Aircraft departing Bristol which are automatically code-callsign converted (correlated) with the correct callsign and are not displaying a squawk error (DUPE) indicator within the track data-block are deemed identified and validated. The first radar controller working these aircraft must however verify the Mode C return.

Any aircraft that does not automatically code-callsign convert, is displaying an incorrect callsign, or that is displaying a squawk error (DUPE) indicator shall be reassigned a unique



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code; however, for initial identification a controller may request an IDENT to avoid requiring the pilot to set a new squawk during the workload intensive departure phase.

Aircraft departing any other unit outside controlled airspace, which has been passed a UKCP airways SSR code or a Bristol APC local SSR code shall be instructed to IDENT or identified by another method regardless of whether automatic code-callsign conversion has taken place.

#### 1.8 SSR Code Allocation

Bristol APC shall allocate codes in the range 5050-5076.

RAD will typically reserve codes in the range 5071-5076 for coordination with adjacent units.

Aircraft who are VFR and operating within the Bristol CTR shall be assigned the VFR conspicuity code of 5070. This is not a discreet code and cannot be used for identification.

Code 5077 is the designated frequency monitoring code ("listening squawk"), aircraft squawking this code in the vicinity of the Bristol CTR/CTA should be maintaining a listening watch on the Bristol APC frequency 125.650 MHz, however the Mode A and C readout displayed must be considered unvalidated and unverified, respectively.



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## Chapter 2 Bristol Radar (RAD)

#### 2.1 Responsibilities

Bristol Radar (RAD - 125.650 MHz) is responsible for:

- Acceptance of releases and control of aircraft inbound to Bristol from the release point until control is transferred to either DIR or AIR
- Coordination and control of overflying aircraft within the Bristol APC area of responsibility
- Initial sequencing of IFR traffic conducting ILS, NDB, RNP and/or visual approaches
- Control of aircraft departing Bristol on designated SIDs until control is transferred to either Cardiff APC or the relevant Area Control sector
- Intermediate control of Cardiff/St Athan IFR inbounds from the east following release from Area Control until transfer to Cardiff APC
- Provision of a radar service to IFR departures and arrivals not routing via the ATS Route Network
- Control of non-IFR traffic entering, operating in, or leaving Bristol controlled airspace except for VFR traffic operating below 2000 ft which is delegated to AIR
- Liaison with the AIR controller on pertinent issues excepting range checks and final approach spacing
- Executive coordination with other units
- Provision of UK Flight Information Services (subject to workload) to aircraft operating outside controlled airspace below FL100 and within 40 NM of Bristol.

RAD assumes responsibility for ADC and DIR functions outside their periods of operation.

### 2.2 Coordination with AIR

#### 2.2.1 Departure Zones

RAD should be aware of the provisions outlined in <u>SEP 3.3</u> and their responsibility to coordinate with AIR when descending below MSL in these regions.

#### 2.2.2 Traffic Requiring Coordination

RAD shall coordinate with AIR:

- SVFR arrivals and transits
- VFR transit traffic operating on the RAD frequency below 4000 ft should be coordinated with AIR to protect missed approaches and departures
- VFR arrival and transit traffic at or below 2000 ft (2500 ft at night) is to be prenoted to AIR and transferred once inside controlled airspace.

#### 2.3 Coordination with DIR

#### 2.3.1 Standing Agreement

RAD will position aircraft in the general direction of the downwind leg, descending no lower than 6000 ft, and clear of the departure zone and other traffic under the control of RAD. Aircraft will be released for turns/descent upon transfer of communication between RAD and DIR. Coordination, if required, can be affected to suit the traffic situation.



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## 2.3.2 Missed Approaches

AIR will coordinate and transfer missed approaches (including planned low approaches) to RAD as they will be in the departure zone which is the responsibility of the RAD controller. RAD shall re-integrate the inbound into the arrival sequence and coordinate with DIR as to presentation of the traffic at hand-over.

#### 2.3.3 Training Flights

Aircraft conducting training flights should initially be worked by RAD.

#### 2.4 Coordination with Cardiff APC

#### 2.4.1 General

The following procedures require individual coordination with Cardiff APC and complement the silent transfer agreements documented in <u>APC 4.2</u> and <u>APC 5.8</u>. All coordination shall be with Cardiff Radar (FF RAD 1) - 125.850 MHz.

#### 2.4.2 Common Minimum Stack Level (MSL)

A common Minimum Stack Level (MSL) must be agreed between Bristol and Cardiff, based on the lowest QNH value at both units. This shall be reviewed and agreed at every QNH change between the relevant controllers.

#### 2.4.3 Holding Procedures

See the provisions in APC 6.2 for coordination between Bristol and Cardiff regarding traffic in the BRI hold.

#### 2.4.4 RNAV1 STARs/Traffic via DAWLY Requesting an RNP Approach

The ADVED 1A and BAXUN 1A STARs are designated for RNAV1 traffic wishing to conduct an RNP approach into Bristol and should **only** be assigned by Cardiff APC when an RNP approach is requested by the pilot.

Cardiff will coordinate with Bristol any aircraft via EXMOR requesting these STARs and, if agreed, issue the STAR to the pilot. Traffic routing via the RNP STARs shall be transferred in accordance with the standing agreement for Bristol inbounds from the south on the TOJAQ 1B STAR but may remain on own navigation.

#### 2.4.5 Westbound Low-Level Traffic on Q63

Coordination shall be affected by RAD with Cardiff APC on all traffic routing westbound on Q63 below FL135. Transfer of communication and control will be 5 NM east of ICCIN.

#### 2.5 Standard IFR Traffic

Agreements for standard IFR inbounds to Bristol are documented at  $\underline{APC\ 4.1.1}$ ,  $\underline{APC\ 4.1.2}$  and  $\underline{APC\ 4.2.1}$ .

Agreements for standard IFR outbounds from Bristol are documented at APC 5.6, APC 5.7 and APC 5.8.



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Agreements for standard IFR inbounds to Cardiff and St Athan are documented at  $\underline{\text{APC 4.1.3}}$  and  $\underline{\text{APC 4.2.2}}$ .

#### 2.6 Non-Standard IFR Traffic

RAD is responsible for providing a radar service to non-ATS Route departures and arrivals and whilst they are clear of controlled airspace is (subject to workload) responsible for providing a UK Flight Information Service to traffic operating below FL100 within 40 NM of Bristol and any traffic leaving controlled airspace should be offered a service.

GMC will request clearance from RAD for any non-standard IFR departure.

After departure instructions for non-ATS Route departures (except for aircraft of 5700 kg or less) must comply with the noise preferential routings in GEN 4.2.



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#### 2.7 Low-Level Traffic in Delegated Airspace (Q63)

#### 2.7.1 General Procedures

RAD is responsible for the control of all overflights within the delegated airspace (Cotswold CTA-3/CTA-13, DB-FL135) including flights routing along ATS Routes. Adjacent units will be required to coordinate aircraft which request to cross or enter the controlled airspace that RAD is responsible for.

AC West retains responsibility for all controlled airspace above FL135 except that Cardiff APC is responsible for delegated airspace DB-FL165 as depicted in Figure 4.

Whenever transiting traffic is likely to affect flights inbound to Bristol via BCN or UBCAM, Cardiff APC shall be notified and inbounds subject to individual coordination.

#### 2.7.2 Radar Separation Minima

Within delegated airspace Bristol APC, Cardiff APC and AC West are authorised to apply 3 NM horizontal radar separation.

Outside of delegated airspace AC West may only apply 5 NM horizontal radar separation and this must be established prior to control being transferred to AC West and prior to traffic leaving delegated airspace.

#### 2.7.3 Coordination of Overflights with Area Control

#### 2.7.3.1 Deemed Coordination of En-route Traffic

Bristol APC and AC West may apply deemed coordination of en-route traffic in accordance with London FIR (EGTT) vMATS Part 2 GEN Chapter 5.2.

Cruising traffic which has reached the RFL indicated on the flight plan is deemed to have been coordinated provided that:

- The aircraft is at a correct level for the direction of flight,
- The RFL has not been changed within 30 NM of the area of responsibility boundary (see note), and
- No objection has been raised by the receiving controller.

**Note:** Any change to the RFL within Bristol Delegated Airspace should be notified to AC West.

Transfer of control is at the boundary of delegated airspace, unless otherwise coordinated. Traffic climbing/descending to the RFL must be level by the boundary in order to be considered deemed coordinated.

#### 2.7.3.2 Electronic Coordination

APC controllers using EuroScope and UKCP may use the EuroScope electronic coordination facility with Area Control. Electronic coordination requires less time to perform and generally lowers controller workload. Unlike verbal coordination, it does not require both controllers' attendance at the same time. However, it is not suitable for time critical situations where a timely response is essential.



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The EuroScope coordination feature allows aircraft to be offered and received at a different level and/or routing. Should controllers wish to amend how the aircraft is offered or received from the default agreement displayed, they may do so using this feature. The receiving controller must acknowledge the request for it to be deemed as coordinated.

Additionally, the UKCP release function allows controllers to flag release restrictions relating to turns/descent electronically.

#### 2.7.4 Flights Joining the ATS Route Network at BADIM/OZZIL

The following information applies to flights:

- from Oxford (EGTK) with an RFL FL105- routing westbound via either BADIM DCT ICCIN Q63 or OZZIL Q63, and
- from Gloucester (EGBJ) routing eastbound via BADIM DCT BUCFA L607.

#### <u>Traffic westbound via BADIM/OZZIL cruising below FL105:</u>

Flights will be pre-noted to Bristol RAD and an SSR code and contact frequency requested.

#### **Traffic eastbound via BADIM:**

Flights will be pre-noted to Bristol RAD and AC West and an SSR code and contact frequency requested. Bristol shall identify the traffic and climb to FL130. Traffic shall be transferred to AC West on track BUCFA 10 NM in trail with EGGD departures.

In all cases traffic will be transferred outside of controlled airspace and Bristol RAD shall issue joining clearance.

**Note 1:** Oxford outbounds with an RFL FL105+ (joining via CONKO) will be coordinated with AC West and will not transit Bristol delegated airspace (except that Oxford traffic with an RFL between FL105-FL135 may flight plan via CONKO and if routing westbound will be coordinated through the Bristol delegated airspace).

**Note 2:** Gloucester outbounds routing westbound (via BCN) will be coordinated with Cardiff APC.

**Note 3:** Kemble (EGBP) outbounds joining the ATS route network will do so via CONKO and are cleared to join controlled airspace by AC West. Flights routing eastbound below FL135 will be coordinated with Bristol RAD as will slow climbing flights with an RFL above FL 135.

#### 2.8 VFR and SVFR Traffic

VFR and SVFR traffic shall be handled in accordance with GEN 3.1-3.4.

RAD is to provide standard separation between IFR and SVFR traffic, and between SVFR and other SVFR traffic, except when AIR agrees to provide RSIVA. There are no deemed separation standards for SVFR traffic.

#### 2.9 Provision of UK Flight Information Services

MATS Part 1 details the services which may be provided outside controlled airspace. The provision of UK FIS can be provided by Bristol subject to workload.



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Outside the hours of operation and/or boundaries of responsibility of adjacent units tasked with providing the Lower Airspace Radar Service (LARS), RAD may provide UK FIS to traffic flying outside controlled airspace, but normally only within the vicinity of the Bristol CTR/CTA.

The adjacent units tasked with providing LARS are listed at <u>GEN 3.1</u> and consideration should be given to transferring UK FIS traffic which is not seeking to transit the Bristol CTR/CTA to these units.

Controllers must not give a Deconfliction Service or radar vectors under a Traffic Service to aircraft below SMAA levels or minimum sector altitudes.

A radar service outside of 40 NM of Bristol must not be given.



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### **Chapter 3** Bristol Director (DIR)

### 3.1 Responsibilities

Bristol Director (DIR - 136.080 MHz) is responsible for:

- Final sequencing of IFR traffic conducting ILS, NDB, RNP and/or visual approaches following transfer of control from RAD
- Liaison with the AIR controller on range checks and final approach spacing.

RAD assumes responsibility for the provision of DIR functions when the positions are operating combined.

#### 3.2 Coordination with AIR

DIR shall provide AIR with a 10 NM range check with regards to:

- Traffic conducting other than an ILS approach (type of approach must be specified)
- Traffic which is not code-callsign converted
- Traffic which is conducting a training approach or not intending to land.

DIR shall coordinate with AIR as to the agreed final approach spacing.

### 3.3 ILS Approaches

The default approach shall be an ILS approach for whichever runway is in use at Bristol. Approach controllers should note the characteristics of the ILS system on each runway as during LVP pilots may request an approach to the non-duty runway during Runway 09 operations:

Runway 09 – ILS **CAT I** 3.0° glidepath Runway 27 – ILS **CAT III** 3.0° glidepath

#### 3.4 RNP and Non-Precision Approaches

RNP, LOC/DME and NDB/DME approaches are available to both runways.

Aircraft requesting an RNP approach will typically be radar vectored towards the appropriate RNP Intermediate Fix (IF) based on the runway in use however traffic from the south-west may route on own navigation via the ADVED/BAXUN RNAV1 STARs to the appropriate Initial Approach Fix (IAF) positioned on a base leg.

Aircraft requesting a non-precision approach should typically be radar vectored to final, to establish prior to the Final Approach Fix (FAF). Full procedural approaches shall be coordinated with RAD and AIR as required due to the likely delay to outbound traffic.

**Note 1:** When vectoring for an RNP approach, controllers shall not issue vectors to any point beyond the IF except that to ensure controlled airspace containment for RNP approaches to Runway 09 controllers may position an aircraft to establish no later than 2 NM from the FAF.

**Note 2:** When an instruction is issued to resume own navigation, the aircraft's current track must be within 45 degrees of the IAF.



**Note 3:** The Bristol QNH must be included in the approach clearance.

### 3.5 Final Approach Separation

DIR is responsible for applying both radar and wake turbulence **separation** on final approach until touchdown.

Radar separation minima are described in <u>SEP 1.3</u>; Wake turbulence separation between aircraft on final approach shall be applied in accordance with MATS Part 1 (CAP 493).

The 'catch-up' (sometimes referred to as compression) that occurs after the leading aircraft passes 4 NM from touchdown must be factored into the spacing provided, to ensure that radar and wake turbulence separation are ensured until touchdown. In most cases, adding 1 NM to the required separation between aircraft and maintaining this until 4 NM from touchdown will act as a sufficient buffer.

**Note 1:** APC shall not assume Reduced Separation in the Vicinity of an Aerodrome is being applied without coordination with ADC.

**Note 2:** Aircraft performing a visual approach are responsible for their own wake turbulence separation.

If either radar or wake turbulence separation are eroded below the required minima, the approach must be discontinued and the aircraft taken off the approach.

### 3.6 Final Approach Spacing

DIR shall coordinate with AIR to agree the required spacing taking into account the spacing required for pending departures and the number of inbounds and any delay.

Typical spacing would be 6 NM to allow for a departure between every inbound.

#### 3.7 Transfer of Communication

Aircraft shall be transferred to AIR in the intended landing order before reaching 6 NM on final approach.

#### 3.8 Missed Approaches

DIR will not initially handle missed approaches due to the aircraft entering the departure zone. Individual coordination will be affected by RAD once the aircraft is re-integrated into the arrival stream.



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# **Chapter 4** Inbound Procedures

### 4.1 Agreements with AC West

#### 4.1.1 Bristol Inbounds

The following agreement is used between AC West and RAD for Bristol inbounds from the east.

STAR	Agreement
ICTAM 1B	Descending FL100, on a heading to pass north CONKO, separated from any Bristol departures. Traffic is released for descent to the base of controlled airspace.

### 4.1.2 Bristol Inbounds (Cardiff APC Closed)

In the absence of Cardiff APC, the following agreements shall be used between AC West and RAD for Bristol inbounds from the north, south and west. The inbound agreement above for traffic from the east remains active.

All traffic shall be transferred clean of traffic unknown to Bristol APC and released for turns on contact. Bristol APC is responsible for separation against outbounds once inbound traffic is issued descent below the release level in accordance with the release agreement.

STAR	Agreement
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WEVBE 1B  FIFAH 1B BAJJA 1B	Descending FL110
DAWLY TOJAQ 1B	Descending FL100

- **Note 1:** Traffic may be transferred either on own navigation to BRI or on an appropriate radar heading, or when coordinated direct ELROV/EMPAS.
- **Note 2:** Traffic shall be transferred clean of traffic unknown to Bristol APC and released for turns and descent on contact.
- **Note 3:** Bristol APC is responsible for separation against outbounds once inbound traffic is issued descent below the release level.
- **Note 4:** AC West shall transfer inbounds on the TOJAQ/DAWLY 1B and shall not issue the ADVED 1A or BAXUN 1A STAR unless specifically requested by the pilot.



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#### 4.1.3 Cardiff/St Athan Inbounds

The ICTAM 1C arrival transits through the Bristol APC area of responsibility and thus must be worked by RAD. The following agreement is used between AC West and RAD for Cardiff/St Athan inbounds.

STAR	Agreement
ICTAM 1C	Descending FL120, to pass north CONKO, separated from any Bristol departures. Traffic is released for descent to the base of controlled airspace.

### 4.2 Agreements with Cardiff APC

### 4.2.1 Bristol Inbounds (Cardiff APC Online)

Cardiff shall ideally transfer traffic once clear of traffic unknown to Bristol. Inbound traffic from the north and west shall be transferred by Cardiff APC no later than the Bristol CTA boundary or radar buffer zone (whichever is earliest). Inbounds from the South shall be transferred no later than entry into the Burnham Box.

STAR	Agreement
WEVBE 1B	Descending FL110 on track or on a radar heading towards the BRI NDB (Note 1)
FIFAH 1B	Descending FL110 on a radar heading towards a point 3 NM south of
BAJJA 1B	ICCIN (Note 2)
ADVED 1A	Descending to MSL on a radar heading to parallel the southern CTA
BAXUN 1A	boundary (ideally within 2 NM of the boundary), positioned with the
DAWLY 1B	Burnham Box (APC 1.2.2) (Notes 3 and 4)
TOJAQ 1B	

**Note 1:** Aircraft are released for descent to MSL on contact. Traffic is fully released once east of the Bristol/Cardiff buffer zone.

**Note 2:** Aircraft released for descent to MSL and right turn within Cardiff airspace. Aircraft are not released for left turns until east of the Bristol/Cardiff Buffer zone.

**Note 3:** The ADVED/BAXUN STARs shall only be assigned following coordination; inbounds assigned these STARs may remain on own navigation.

**Note 4:** Aircraft are released for descent to MSL and right turn on transfer. When runway 09 is in use, traffic is released for descent within the Burnham box and is released for left turn east of the Bristol/Cardiff buffer zone. When runway 27 is in use, traffic is released for turn and descent east of the Bristol/Cardiff buffer zone and clear of the Departure Zone (SEP 3.3).



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# 4.2.2 Cardiff/St Athan Inbounds

STAR	Cardiff Runway 12	Cardiff Runway 30
ICTAM 1C	Descending FL80, positioned on a radar heading to the north of the CDF and transferred when clear of conflicts.	Descending to 3500 ft on the Cardiff QNH level by 10 DME, positioned on a radar heading towards a 10 NM final (Note 2)

**Note 1:** Aircraft are fully released upon transfer of communication to Cardiff APC.

**Note 2:** When Cardiff Runway 30 is in use transfer shall be to FF RAD 2 ("Cardiff Radar") - 119.150 MHz.



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### **Chapter 5 Outbound Procedures**

#### 5.1 General

RAD is responsible for the initial control of:

- All SID departures off Runway 09
- HAWFA SID departures off Runway 27 during the hours of operation of Cardiff APC

Outside the hours of operations of Cardiff APC, Bristol APC will take initial control of all Bristol SID departures regardless of route.

Initial separation between departing aircraft is the responsibility of AIR and is normally achieved by the application of timed intervals between successive departures. AIR will inform RAD if an aircraft is observed to deviate from the expected departure track to the extent that departure separation may be eroded.

### 5.2 Identification of Departing Traffic and SSR Validation/Verification

RAD is responsible for identification, and SSR validation and verification of Bristol outbounds under its control in accordance with APC 1.7.

### 5.3 Departure Speed Limits

All outbound traffic is to comply with the 250 knot speed limit whilst within Class C or D airspace. This restriction must not be removed by Bristol APC unless for safety reasons or when operationally necessary for the flight (ie. the minimum clean speed is in excess of 250 knots).

#### 5.4 Departures Subject to Radar Approval

SID departures are free-flow. VFR departures below 2000 ft will be pre-noted to RAD.

For any departures in the following list AIR must obtain a **departure release** from RAD before clearing the aircraft for take-off:

- For a non-standard IFR departure or SVFR departure **and** the subsequent departure
- For an aircraft not in the speed group table **and** the subsequent departure
- For departures other than from the runway in use **and** the subsequent departure
- For VFR departures operating above 2000 ft
- Following a missed approach
- Whenever RAD implements a radar check.

# 5.5 Vectoring and Climbing Departures

All Bristol SID departures have an initial climb to 6000 ft.

**Note:** During periods of holding at the BRI **below** MSL outbounds will require a departure check and/or amended after departure instructions that ensure vertical separation against holding traffic.

Except when required for reasons of safety (including but not limited to emergencies, ensuring separation, weather avoidance), aircraft are not to be vectored off the NPR track until above 4000 ft.



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#### 5.6 Agreements with AC West

Bristol APC shall identify, validate and verify HAWFA/YORQI/east departures and climb according to the agreement below prior to transfer to AC West.

SID/Route	Agreement	
HAWFA/YORQI or east via L607	Climbing FL130 on track or own navigation to BUCFA	
LEKCI (Cardiff runway 12)	Climbing FL150 on track or own navigation to HAWFA	

#### 5.7 Agreements with AC West when Cardiff APC Offline

In the absence of Cardiff APC, Bristol APC shall identify, validate and verify all departures and climb according to the agreements below prior to transfer to AC West. Departures via HAWFA/YORQI are as per APC 5.6. Depending on the traffic situation, it may be prudent to coordinate further climb with AC West so as to deconflict against inbounds, especially when in an easterly configuration.

SID/Route	Agreement
BCN or west via Q63	
BCN or north via N862	Climbing FL90
EXMOR or south via N864	

#### 5.8 Agreements with Cardiff APC

### 5.8.1 Bristol Departures

Bristol APC shall identify, validate and verify Runway 09 departures and climb according to the agreement below prior to transfer to Cardiff APC. Runway 27 departures (excluding HAWFA) are transferred from AIR direct to Cardiff APC.

SID/Route	Runway 09	Runway 27	
BCN or west via Q63		Transfer from AID direct to	
BCN or north via N862	Climbing FL130 (Note 1)	Transfer from AIR direct to Cardiff APC (Notes 1 and 2)	
EXMOR or south via N864	_	Cardin APC (Notes 1 una 2)	

**Note 1:** Bristol APC will transfer to Cardiff APC by silent handover, clean of other traffic, on the SID track or an appropriate radar heading. Traffic is released for further climb upon transfer of communication and turns off the SID track or assigned heading once west of the radar buffer zone.

**Note 2:** When traffic is holding at the BRI below the agreed MSL, then each IFR departure from Runway 27 will be initially controlled by Bristol APC and coordination will be effected with Cardiff APC prior to transfer of communication. This is to occur no later than the Bristol CTA boundary.



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## **5.8.2** Cardiff Departures

Cardiff APC will identify, validate and verify LEKCI departures (only available from runway 12) and climb according to the agreement below before transfer to Bristol APC.

SID/Route	Runway 12	Runway 30
LEKCI 1B	Climbing FL 80 (See Note)	N/A

**Note:** Traffic is released for right turns and climb.



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### **Chapter 6 Holding Procedures**

### 6.1 Holding Pattern

Bristol traffic may be held at the BRI NDB:

Hold	Inbound Course	Direction	Holding Levels	Holding Speed
BRI	271°	Left	2500 ft – FL165 (see Note)	ICAO speeds

**Note:** Traffic shall **not** normally be held below MSL. During periods of holding at the BRI **below** MSL outbounds will require a departure check and/or amended after departure instructions that ensure vertical separation against holding traffic.

### 6.2 Responsibility for Holding Traffic

When the BRI hold is in use, coordination must be affected between Bristol APC, Cardiff APC and AC West to ensure standard separation is maintained and standing agreements terminated as appropriate. This is especially important when holding is occurring above FL80 (as the lowest standing agreement level is FL90).

Bristol APC is responsible for control of the hold up to FL105. Between FL105 and FL165, Cardiff APC is responsible for control of the BRI hold however coordination can be affected to retain the aircraft on Bristol Radar's frequency.

When traffic is holding at the BRI, below the agreed MSL, then each IFR departure from Runway 27 will be initially handled by Bristol APC and coordination is to be affected with Cardiff APC prior to hand over. This is to occur no later than the CTA boundary.

### **6.3** Holding Pattern Separation

The CDF and BRI holds are deemed separated up to FL105.



# **GLOSSARY**

Abbreviation	Section
AC	Area Control
ADC	Aerodrome Control
AIR	Air Control
APC	Approach Control
CAS	Controlled Airspace
СТА	Control Area
CTR	Control Zone
DIR	Bristol Director – 136.080 MHz
DME	Distance Measuring Equipment
EAT	Estimated Approach Time
FIS	Flight Information Service
FL	Flight Level
ft	Foot (feet)
GS	Groundspeed
hPa	Hectopascals
IAS	Indicated Airspeed
ICAO	International Civil Aviation Organisation
ILS	Instrument Landing System
Kts	Knots
MDI	Minimum Departure Interval
MHz	Megahertz
MSL	Minimum Stack Level
NM	Nautical Mile
OCA	Obstacle Clearance Altitude
ОСН	Obstacle Clearance Height
RAD 1	Bristol Radar – 125.650 MHz
RFC *	Released for Climb
RFD *	Released for Descent
RFT *	Released for Turn
SID	Standard Instrument Departure
SSR	Secondary Surveillance Radar
STAR	Standard Terminal Arrival Route

<sup>\*</sup> Although these acronyms are not used in this document, they may be useful for controllers to be aware of as common notation in text coordination.