

[REDACTED]  
[REDACTED]

26 April 2017  
Reference: F0003133

Dear [REDACTED]

I am writing in respect of your recent request, for the release of information held by the Civil Aviation Authority (CAA). Your request has been considered in line with the provisions of the Freedom of Information Act 2000 (FOIA).

In relation to our recent communications regarding Gatwick Route 5 – easterly departures, we advised the Parish Council on 19 January 2017, that Gatwick airport will deliver us the simulator test results through a Validation Report. We are now in receipt of the report and we are able to disclose it to you in attachment 1.

In accordance with Section 40(2) of the FOIA, we have redacted all personal data from the report as to release the information would be unfair to the individuals concerned and would contravene the first data protection principle that personal data shall be processed fairly and lawfully. A copy of Section 40(2) can be found below.

If you are not satisfied with how we have dealt with your request in the first instance you should approach the CAA in writing at:-

Caroline Chalk  
Head of External Information Services  
Civil Aviation Authority  
Aviation House  
Gatwick Airport South  
Gatwick  
RH6 0YR

[caroline.chalk@caa.co.uk](mailto:caroline.chalk@caa.co.uk)

The CAA has a formal internal review process for dealing with appeals or complaints in connection with Freedom of Information requests. The key steps in this process are set in the attachment.

Should you remain dissatisfied with the outcome you have a right under Section 50 of the FOIA to appeal against the decision by contacting the Information Commissioner at:-

Information Commissioner's Office  
FOI/EIR Complaints Resolution  
Wycliffe House  
Water Lane  
Wilmslow  
SK9 5AF  
<https://ico.org.uk/concerns/>

If you wish to request further information from the CAA, please use the form on the CAA website at <http://publicapps.caa.co.uk/modalapplication.aspx?appid=24>.

Yours sincerely

A handwritten signature in black ink that reads "Rihanne Stephen". The signature is written in a cursive style with a large 'R' and 'S'.

Rihanne Stephen  
Information Rights Officer

## **CAA INTERNAL REVIEW & COMPLAINTS PROCEDURE**

- The original case to which the appeal or complaint relates is identified and the case file is made available;
- The appeal or complaint is allocated to an Appeal Manager, the appeal is acknowledged and the details of the Appeal Manager are provided to the applicant;
- The Appeal Manager reviews the case to understand the nature of the appeal or complaint, reviews the actions and decisions taken in connection with the original case and takes account of any new information that may have been received. This will typically require contact with those persons involved in the original case and consultation with the CAA Legal Department;
- The Appeal Manager concludes the review and, after consultation with those involved with the case, and with the CAA Legal Department, agrees on the course of action to be taken;
- The Appeal Manager prepares the necessary response and collates any information to be provided to the applicant;
- The response and any necessary information is sent to the applicant, together with information about further rights of appeal to the Information Commissioners Office, including full contact details.

## **Freedom of Information Act: Section 40**

- (1) Any information to which a request for information relates is exempt information if it constitutes personal data of which the applicant is the data subject.
- (2) Any information to which a request for information relates is also exempt information if-
  - (a) it constitutes personal data which do not fall within subsection (1), and
  - (b) either the first or the second condition below is satisfied.
- (3) The first condition is-
  - (a) in a case where the information falls within any of paragraphs (a) to (d) of the definition of "data" in section 1(1) of the Data Protection Act 1998, that the disclosure of the information to a member of the public otherwise than under this Act would contravene-
    - (i) any of the data protection principles, or
    - (ii) section 10 of that Act (right to prevent processing likely to cause damage or distress), and
  - (b) in any other case, that the disclosure of the information to a member of the public otherwise than under this Act would contravene any of the data protection principles if the exemptions in section 33A(1) of the Data Protection Act 1998 (which relate to manual data held by public authorities) were disregarded.
- (4) The second condition is that by virtue of any provision of Part IV of the Data Protection Act 1998 the information is exempt from section 7(1)(c) of that Act (data subject's right of access to personal data).
- (5) The duty to confirm or deny-
  - (a) does not arise in relation to information which is (or if it were held by the public authority would be) exempt information by virtue of subsection (1), and
  - (b) does not arise in relation to other information if or to the extent that either-
    - (i) the giving to a member of the public of the confirmation or denial that would have to be given to comply with section 1(1)(a) would (apart from this Act) contravene any of the data protection principles or section 10 of the Data Protection Act 1998 or would do so if the exemptions in section 33A(1) of that Act were disregarded, or
    - (ii) by virtue of any provision of Part IV of the Data Protection Act 1998 the information is exempt from section 7(1)(a) of that Act (data subject's right to be informed whether personal data being processed).
- (6) In determining for the purposes of this section whether anything done before 24<sup>th</sup> October 2007 would contravene any of the data protection principles, the exemptions in Part III of Schedule 8 to the Data Protection Act 1998 shall be disregarded.
- (7) In this section-
  - "the data protection principles" means the principles set out in Part I of Schedule 1 to the Data Protection Act 1998, as read subject to Part II of that Schedule and section 27(1) of that Act;
  - "data subject" has the same meaning as in section 1(1) of that Act;
  - "personal data" has the same meaning as in section 1(1) of that Act.

**CLN2Z SID REVISION**

**SID DESIGN RATIONALE**

**Background**

During 2012, Gatwick Airport Ltd (GAL) the owner and operator of London Gatwick Airport (LGW) submitted proposals to the CAA, under the auspices of the Civil Aviation Publication (CAP) 725 - Airspace Change Process (ACP), to replicate the existing conventional Standard Instrument Departure (SID) procedures with revised SIDs that utilised the improved navigational capabilities associated with Area Navigation (RNAV-1) technology.

The aim of the ACP was to design and introduce into service RNAV-1 SIDs that replicated, so far as possible, the nominal track over the ground of the existing conventional SIDs. The CAA approved the introduction of 9 RNAV-1 SID procedures (that used a Track-to-Fix (TF) – Track-to-Fix design format) to comply with Government Policy on ‘track concentration’ of SID designs) in August 2013. These SIDs were introduced into operational service on 14 November 2013 and became mandatory (where applicable) on 1 May 2014.

The subsequent CAP 725-mandated Post Implementation Review (PIR) process concluded during November 2015 with the publication of CAP 1346<sup>1</sup>. The PIR concluded that, although the 9 RNAV-1 SID routes introduced achieved replication of the nominal track of the existing conventional SIDs to an acceptable standard, a higher degree of replication could be achieved along routes 2, 4 and 5. Consequently, GAL was required by the CAA to modify the design of the RNAV-1 SIDs to achieve better replication of the conventional SIDs and to submit the modified design of Route 5

Specifically, whilst complying with:

ICAO PANS-Ops Design Criteria;

DfT Guidance to the CAA dated Jan 2014, specifically;

Government Policy on track concentration;

Notice under Section 78(1) of the Civil Aviation Act 1982;

the PIR determined, inter alia, that the Route 5 RNAV SID (e.g the CLN1Z):

*“is approx. 0.24nm south of the NPR<sup>2</sup> and over Dormansland<sup>3</sup>”.*

and

*“In order to achieve a better replication of the conventional SID the placement of waypoint KKE02 is likely to be required to be repositioned. During the design process an APD will need to*

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<sup>1</sup> Post Implementation Review of RNAV-1 Standard Instrument Departures at Gatwick Airport.

<sup>2</sup> It is assumed this refers to the NPR *centreline* as the mean track of departures is clearly within the NPR swathe; see Figure 1

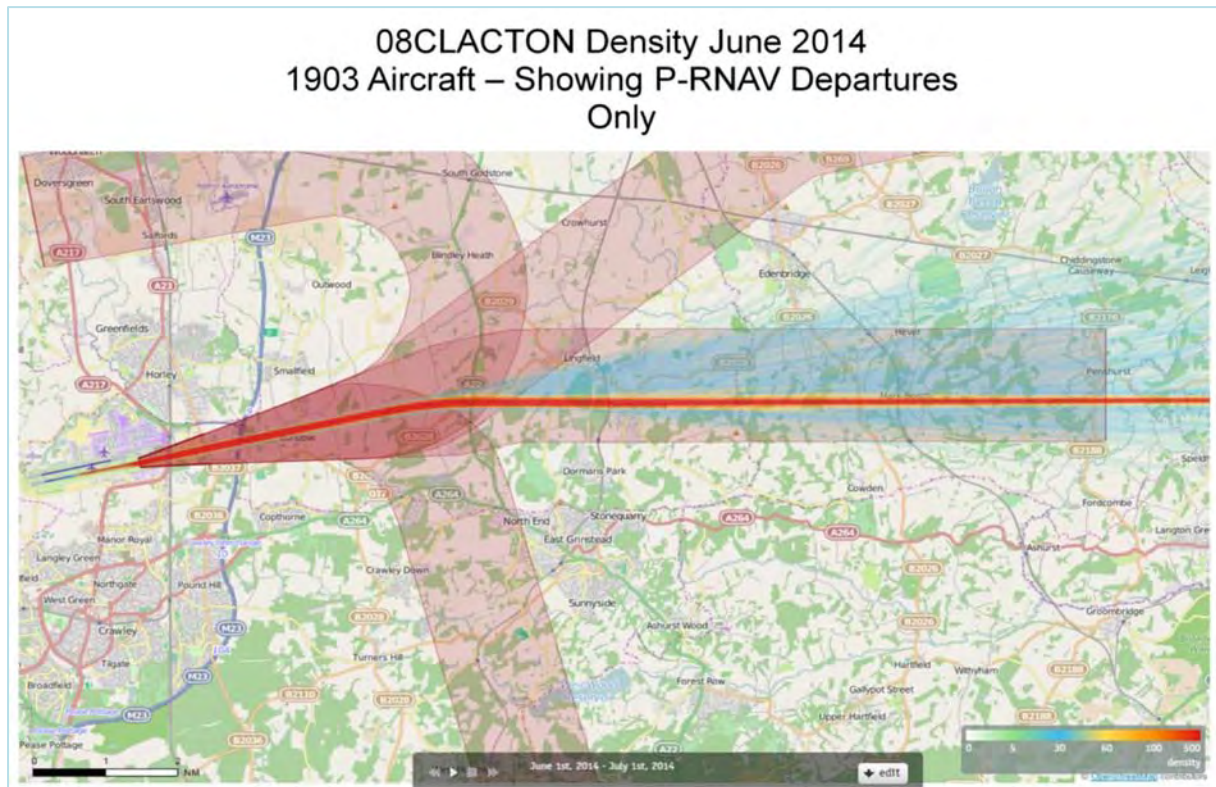
<sup>3</sup> [Annex 6 CAA IFP Recommendations report](#) page 32.

# YOUR LONDON AIRPORT

## *Gatwick*

*consider the merits of using a flyover (FO) waypoint at either current KE02 position or at a repositioned fly by (FB) KKE02 WP.”<sup>3</sup>*

Figure 1 demonstrates graphically the issues referred to. The CAA clearly considered that a better replication of the nominal track of the conventional SID could be achieved which would also have the effect of moving the mean track of aircraft further north so that it lies equidistant between Lingfield and Dormansland.



**Figure 1: CAP 1346 Route 5 RNAV-1Track Concentration**

### **Adoption of Flyby Waypoint**

Due to the level of demonstrated track accuracy, repeatability and concentration achieved with the original CLN 1Z SID design, the CAA-Approved Procedure Designer (APD) opted to continue to utilise a flyby waypoint and relocate KKE02 to new position shown in Figure 2; this should have the desired effect required by the CAA in respect of routing between Lingfield and Dormansland as illustrated in Figure 3.



# YOUR LONDON AIRPORT

## *Gatwick*

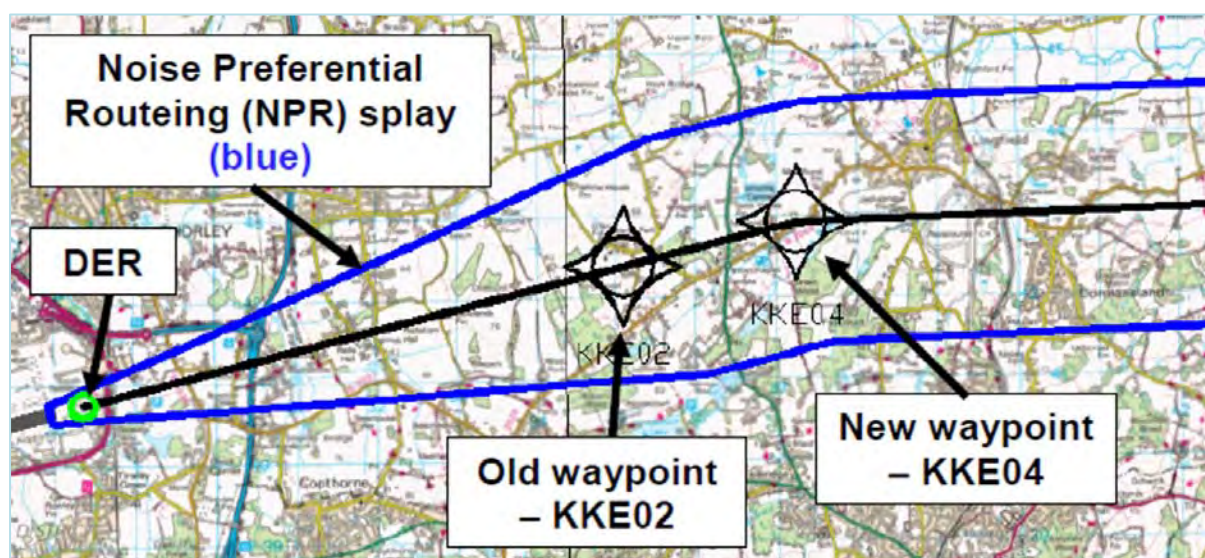


Figure 2: Proposed Change to Route 5 Waypoints



Figure 3: Intended Effect of Changed Waypoint Position on Aircraft Track

A revised Route 5 SID design was first submitted to the CAA by the APD on 25 Feb 16 and finally approved for Flight Validation (FV) testing circa 27 Sep 16.



## **FV Process**

Prior to introduction into operational service, new SIDs are required to undergo a FV process as directed by the then Directorate of Airspace Policy (now Safety and Airspace Regulation Group) Policy Statement - Validation of Instrument Flight Procedures – dated June 2009.

The FV process was detailed in SARG-approved CL-5176-FT-023 Flight Validation Plan-V1.0 dated 14 October 2016.

The FV simulations were conducted 16 October 2016 for both the specified A320 and B737.

Due to simulator time constraints, it was not possible to complete the full SID for each serial. However, those segments of the SID that had been subject to change were subject to worse case scenarios with respect to programmed crosswinds and aircraft maximum weight.

The FV results for the Airbus A320 and B737-800 are at Enclosures 1 and 2 respectively; supporting evidence of simulator screen shots is detailed in attachments to the Enclosures. Unfortunately, not all the end-of-serial graphical data downloaded successfully from the simulator; however, photographs were taken of the end-of-serial screen as a back-up against such an eventuality and these have been substituted in the absence of the simulator derived data. Regrettably, it is not possible to overlay the NPR swathes on the photographs due the obvious parallax errors evident. Notwithstanding that, it is easy to interpolate the data so presented.

## **CONCLUSIONS**

The FV simulations show that:

The proposed new CLN 2Z SID is flyable;

In all wind conditions simulated, aircraft can maintain a repeatable track inside the Route 5 NPR;

In all wind conditions simulated, the new CLN 2Z departures achieved the desired ground track over the Lingfield racecourse, between the Lingfield and Dormansland communities.

## **ACKNOWLEDGEMENTS**

Gatwick Airport Ltd and Reid Aviation Services would like to record the excellent cooperation, enthusiasm and additional effort directed towards this project by:

L-3 Communications Link Simulator & Training UK Ltd, especially [REDACTED]  
and [REDACTED]

AeroNavData, Columbia, Illinois

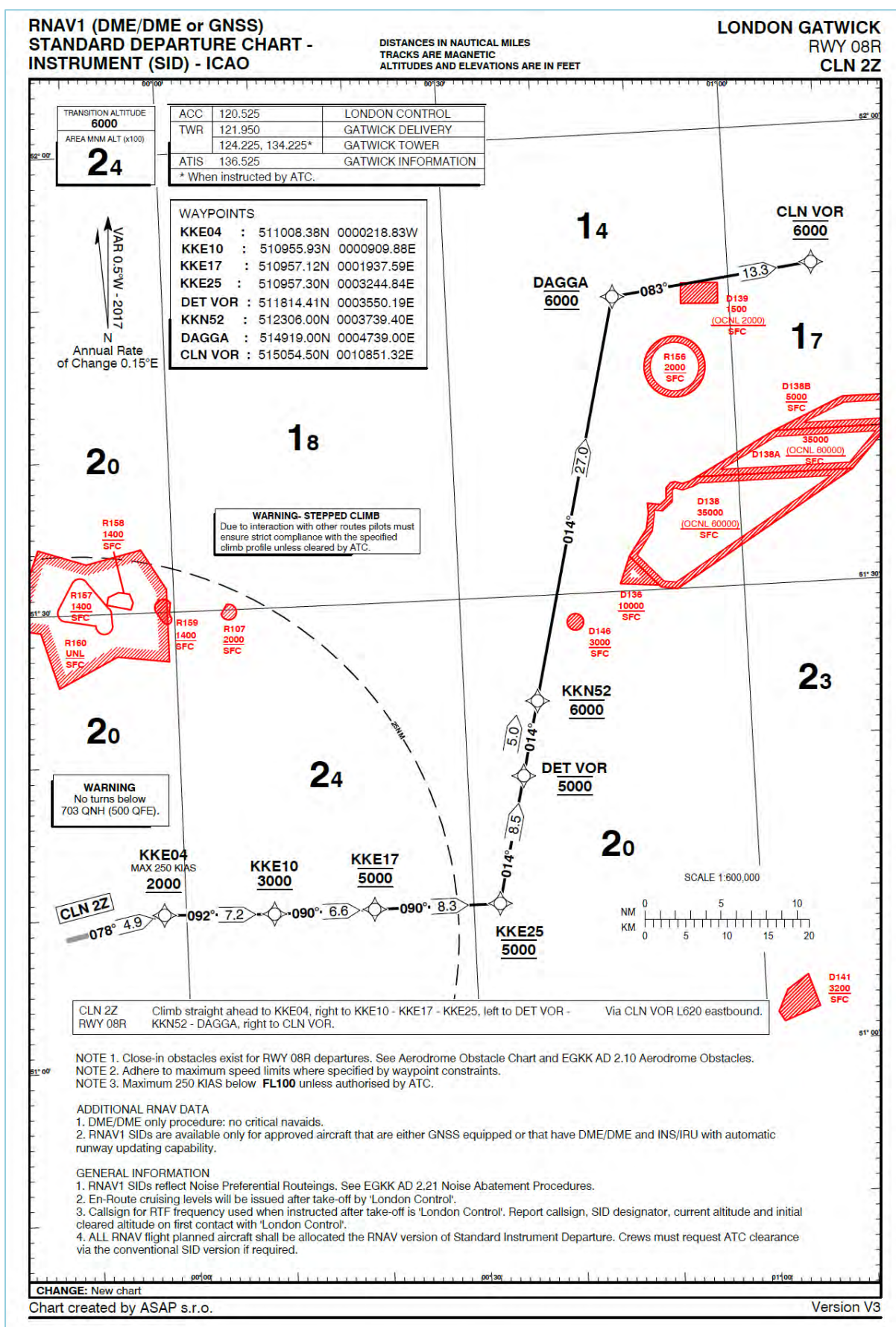
GE Aviation Systems, Grand Rapids, Michigan

Aviation Services Honeywell, Phoenix, Arizona

BradAir Aviation Consultancy



## PROCEDURE CHART



## Enclosure 1

### FLIGHT VALIDATION REPORT – LONDON GATWICK PROPOSED CLN 2Z SID A320

#### New SID with revised Flyby waypoint

#### London Gatwick Runway 08R CLN 2Z

CL-5176-DOC-010 Issue 3

29/07/2016

Mag Var 0.5W (2017) / annual change 0.15E

#### Database coding

Designator	Sequence Number	Path Terminator	Waypoint Name	Waypoint Co-ordinates	Fly-over	Course / Track °M (°T)	Magnetic Variation	Distance (NM)	Turn Direction	Level Constraint	Speed Constraint	Navigation Performance
CLN 2Z	001	CF	KKE04	51°10'08.38"N / 000°02'18.83"W	N	078° (077.6°)	-0.5	4.9	RIGHT	+2000	-250	RNAV1
CLN 2Z	002	TF	KKE10	51°09'55.93"N / 000°09'09.88"E	N	092° (091.6°)	-0.5	7.2	-	+3000	-250	RNAV1
CLN 2Z	003	TF	KKE17	51°09'57.12"N / 000°19'37.59"E	N	090° (089.8°)	-0.5	6.6	-	5000	-250	RNAV1
CLN 2Z	004	TF	KKE25	51°09'57.30"N / 000°32'44.84"E	N	090° (089.9°)	-0.5	8.3	LEFT	5000	-250	RNAV1
CLN 2Z	005	TF	DET	51°18'14.41"N / 000°35'50.19"E	N	014° (013.2°)	-0.5	8.5	-	5000	-250	RNAV1
CLN 2Z	006	TF	KKN52	51°23'06.00"N / 000°37'39.40"E	N	014° (013.2°)	-0.5	5.0	-	6000	-250	RNAV1
CLN 2Z	007	TF	DAGGA	51°49'19.00"N / 000°47'39.00"E	N	014° (013.3)	-0.5	27.0	RIGHT	6000	-250	RNAV1
CLN 2Z	008	TF	CLN	51°50'54.50"N / 001°08'51.32"E	N	083° (083.0°)	-0.5	13.3	-	6000	-250	RNAV1

## FLIGHT VALIDATION REPORT – LONDON GATWICK PROPOSED CLN 2Z SID A320

APPENDIX B

SIMULATOR / FLIGHT VALIDATION REPORT				
<b>Airport Name</b>	London Gatwick (LGW)			
<b>IFP Name</b>	CLN 2Z V3			
<b>Validating Pilot</b>	<b>Name</b>	<b>Title</b>	<b>Licence No</b>	<b>Signature</b>
	[REDACTED]	Captain	[REDACTED]	[REDACTED]
<b>Aircraft Used</b>	<b>Aircraft Type</b>		<b>Aircraft Registration</b>	
	Airbus A320		UKCT628	
<b>RNAV Equipment Used</b>	Honeywell FMGC			
<b>Database Provider</b>	AeroNavData			
<b>Chart Provider</b>	Draft Chart			
<b>AIRAC Date of Data</b>	Special Procedures			
<b>Airport Authority</b>	<b>Name</b>		<b>Appointment</b>	<b>Signature</b>
	[REDACTED] GATWICK AIRPORT LIMITED		[REDACTED]	[REDACTED]
<b>Date</b>	16 October 2016			

## FLIGHT VALIDATION REPORT – LONDON GATWICK PROPOSED CLN 2Z SID A320

## APPENDIX B

Pre Flight Checks For RNAV IFP	Requirement	Result	Remarks
	Procedure loaded and activated from an official database?	Yes / No	
	Waypoint coordinates agree with charted information?	Yes / No	
	Tracks between waypoints agree with charted information?	Yes / No	
	Distances between waypoints agree with charted information?	Yes / No	
	RAIM checked?	Yes / No	N/A
	Runway threshold coordinates confirmed? (See note 2 below)	Yes / No	

## FLIGHT VALIDATION REPORT – LONDON GATWICK PROPOSED CLN 2Z SID A320

## APPENDIX B

Departure		Requirement	Result	Remarks
		Track keeping acceptable?	Yes / No	
		Vertical profile/ Climb gradients acceptable?	Yes / No	
		Turns acceptable/flyable?	Yes / No	
		Track interceptions (if any) after turn achievable?	Yes / No	
		Sufficient track guidance available?	Yes / No	N/A RNAV
		Speed restrictions (if any) acceptable?	Yes / No	
		Speed Limits correctly coded?	Yes / No	
		Altitude restrictions correctly coded?	Yes / No	
		Sequencing of waypoints correct?	Yes / No	
		CDI scale changes activated at appropriate phase of procedure? (See note 3 below)	Yes / No	N/A
		Terminal mode activated at appropriate range? (See note 3 below)	Yes / No	N/A
		Turn anticipation for all waypoints satisfactory?	Yes / No	
		Stabilisation distances between waypoints satisfactory?	Yes / No	
		Cockpit workload?	Low / Medium / High	



Enclosure 1

FLIGHT VALIDATION REPORT – LONDON GATWICK PROPOSED CLN 2Z SID A320

APPENDIX B

<b>General Comments</b> (Obstacle reporting information if required shall also be stated here): All track keeping accurate with no cross track errors throughout	
<div style="height: 150px;"></div>	
<b>Simulator/Flight Validation Result</b>	<b>Simulator/ Flight Captain</b>
Acceptable ✓	Name & Licence No [REDACTED]
Not Acceptable	Signature [REDACTED]
Deferred	Date 16 October 2016

(\*) - Straight, DME Arc, Hold, Racetrack, Alternative procedure, Procedure turn 45/180 - 80/260, Base Turn. etc

**Note.**

1. Where a report item is not applicable for the procedure being validated, delete as required.
2. If the Runway threshold coordinates cannot be confirmed the validation should be discontinued.
3. Where a procedure has been manually entered into the RNAV system in use, this process will not occur automatically. In this case the validating pilot will need to activate the CDI scaling changes during the different phases of the flight.

Version 2.0 – 23 June 2009

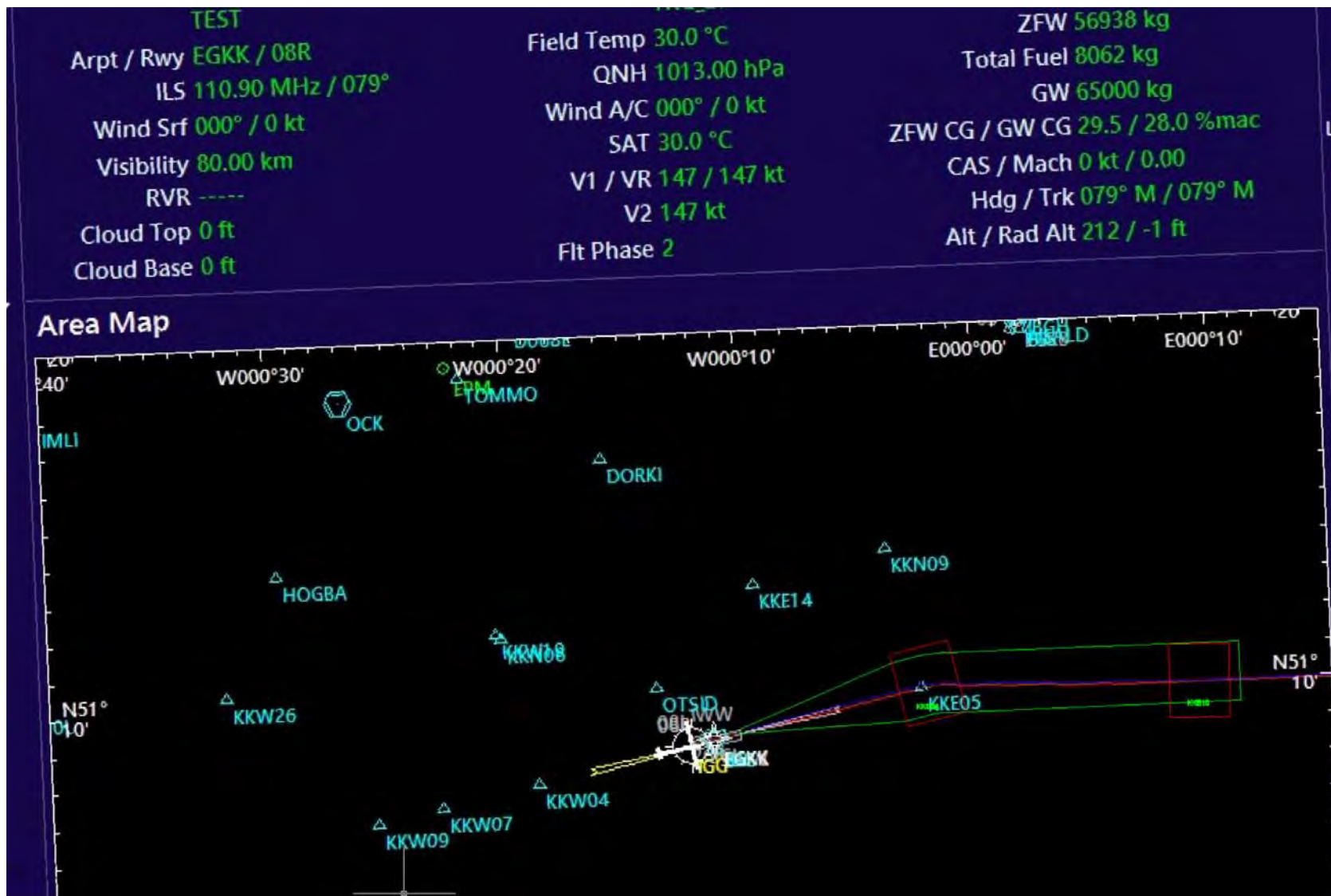
Detailed observations and simulator graphics are at Attachment 1 to this Enclosure



Attachment 1 to Enclosure 1  
CLN2Z A320 Sim

SID NAME	CLN 2Z				
AIRCRAFT/SIM TYPE	A320 UKCT628				
FLIGHT/SIM RUN No:	T/OFF WT XX000KG	QNH	TEMP °C	W/V Kts	Wind Level
Run 1A	65000	1013	+30	Calm	Surface
V1 147					1000
V2 147				120/15	2000
VR 147					3000
					4000
Extended run to DET VOR undertaken to prove that existing SID beyond KK517 had not been affected by				150/25	5000

[illegible]



Nominal Track: Blue

Achieved track: Red

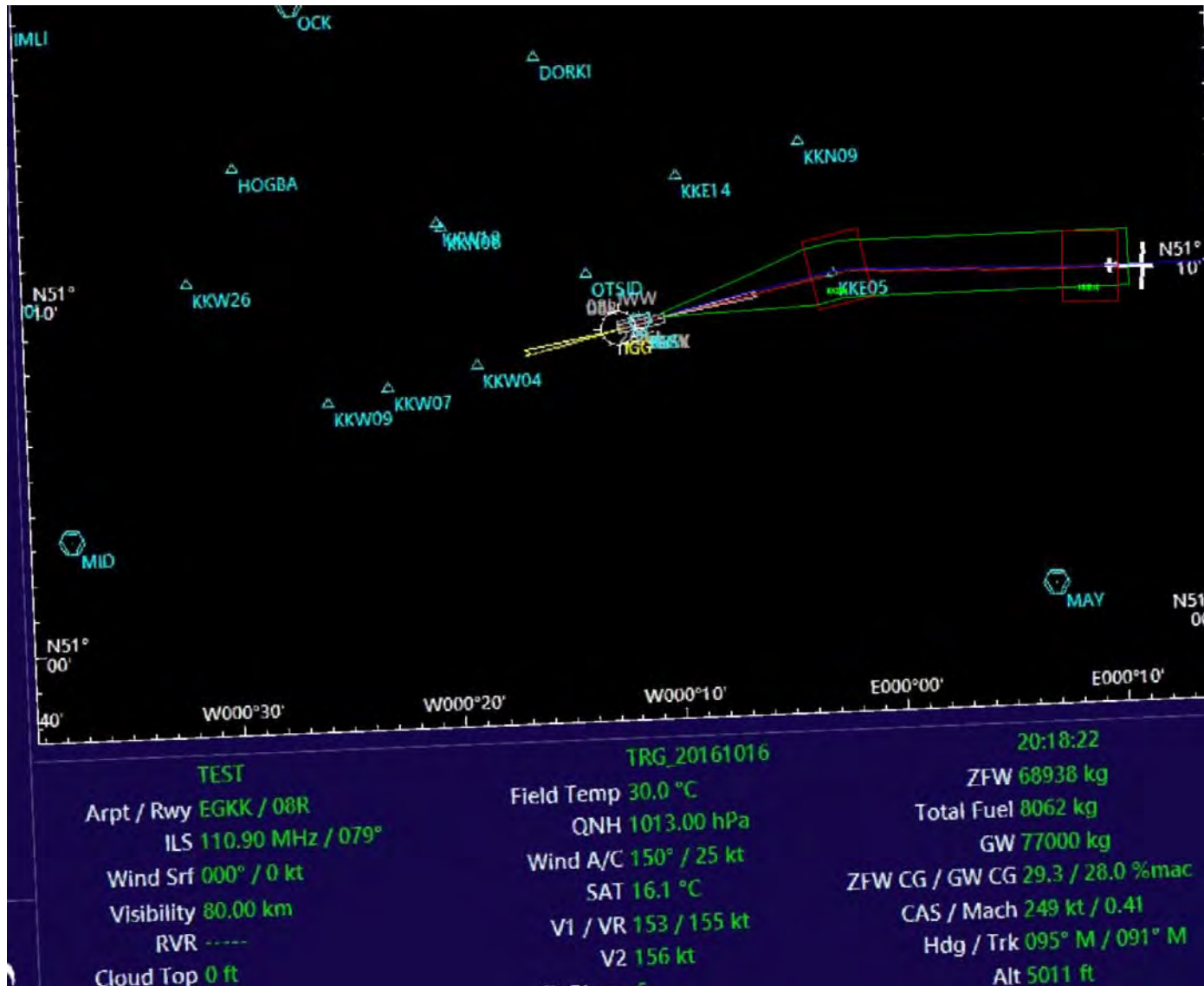
NPR: Light Green



SID NAME	CLN 2Z				
AIRCRAFT/SIM TYPE	A320 UKCT628				
FLIGHT/SIM RUN No:	T/OFF WT XX000KG	QNH	TEMP °C	W/V Kts	Wind Level
Run 2A	77000	1013	+30	Calm	Surface
V1 153					1000
V2 156				120/15	2000
VR 155					3000
					4000
				150/25	5000
Due simulator time availability runs shortened to cover					

Due simulator time availability runs shortened to cover only those waypoints modified

[illegible]



Nominal Track: Blue  
 Achieved track: Red  
 NPR: Light Green

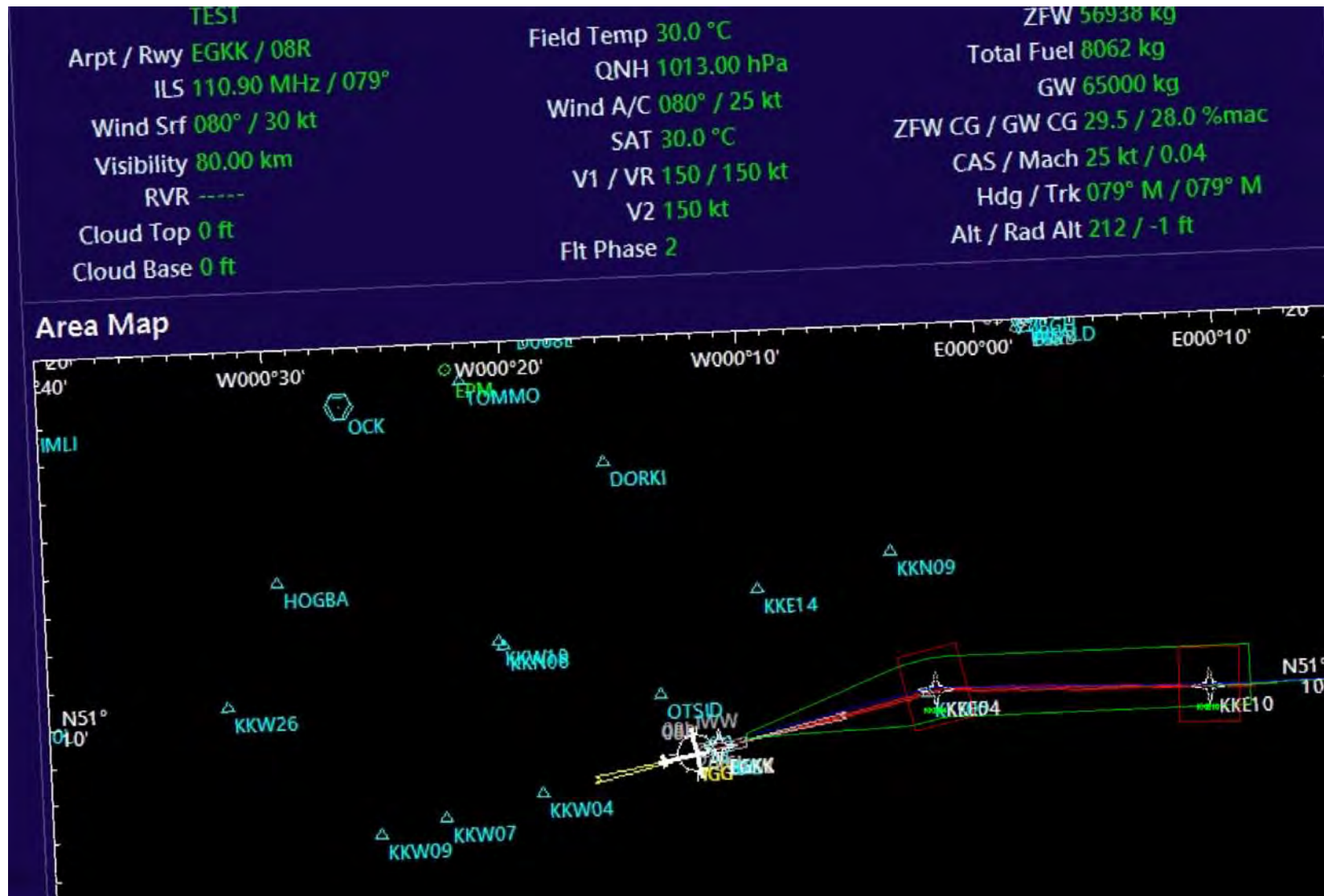
SID NAME	CLN 2Z				
AIRCRAFT/SIM TYPE	A320 UKCT628				
FLIGHT/SIM RUN No:	T/OFF WT XX000KG	QNH	TEMP °C	W/V Kts	Wind Level
Run 3A	65000	1013	+30	080/30	Surface
V1 150					1000
V2 150				110/50	2000
VR 150					3000
					4000
				140/70	5000
Due simulator time availability runs shortened to cover					

## ASSESSMENT REQUIREMENTS (But not limited to)

1

28% MAC

[illegible]



Nominal Track: Blue  
Achieved track: Red  
NPR: Light Green

SID NAME	CLN ZZ				
AIRCRAFT/SIM TYPE	B737 CT630				
FLIGHT/SIM RUN No:	T/OFF WT XX000KG	QNH	TEMP °C	W/V Kts	Wind Level
Run 4A	77000	1013	+30	080/30	Surface
V1 157					1000
V2 159				110/50	2000
VR 157					3000
					4000
				140/70	5000
Due simulator time availability runs shortened to cover					

Due simulator time availability runs shortened to cover only those waypoints modified

[illegible]





Nominal Track: Blue  
Achieved track: Red  
NPR: Light Green

SID NAME	CLN 2Z				
AIRCRAFT/SIM TYPE	A320 UKCT628				
FLIGHT/SIM RUN No:	T/OFF WT XX000KG	QNH	TEMP °C	W/V Kts	Wind Level
Run 5A	65000	1013	+30	170/30	Surface
V1 152					1000
V2 147				200/50	2000
VR 155					3000
					4000
				230/70	5000
Due simulator time availability runs shortened to cover					

Due simulator time availability runs shortened to cover only those waypoints modified

[illegible]



Nominal Track: Blue  
Achieved track: Red  
NPR: Light Green

SID NAME	CLN 2Z				
AIRCRAFT/SIM TYPE	A320 UKCT628				
FLIGHT/SIM RUN No:	T/OFF WT XX000KG	QNH	TEMP °C	W/V Kts	Wind Level
Run 6A	77000	1013.2	+30	170/30	Surface
V1 152					1000
V2 156				200/50	2000
VR 155					3000
					4000
				230/70	5000
Due simulator time availability runs shortened to cover					

### ASSESSMENT REQUIREMENTS (But not limited to)

[illegible]

28% MAC

[illegible]





Nominal Track: Blue  
Achieved track: Red  
NPR: Light Green







Nominal Track: Blue  
Achieved track: Red  
NPR: Light Green

SID NAME	CLN ZZ				
AIRCRAFT/SIM TYPE	A320 UKCT628				
FLIGHT/SIM RUN No:	T/OFF WT XX000KG	QNH	TEMP °C	W/V Kts	Wind Level
Run 8A	77000	1013	+30	350/30	Surface
V1 154					1000
V2 156				320/50	2000
VR 155					3000
					4000
				290/70	5000
Due simulator time availability runs shortened to cover					

Due simulator time availability runs shortened to cover only those waypoints modified

[illegible]



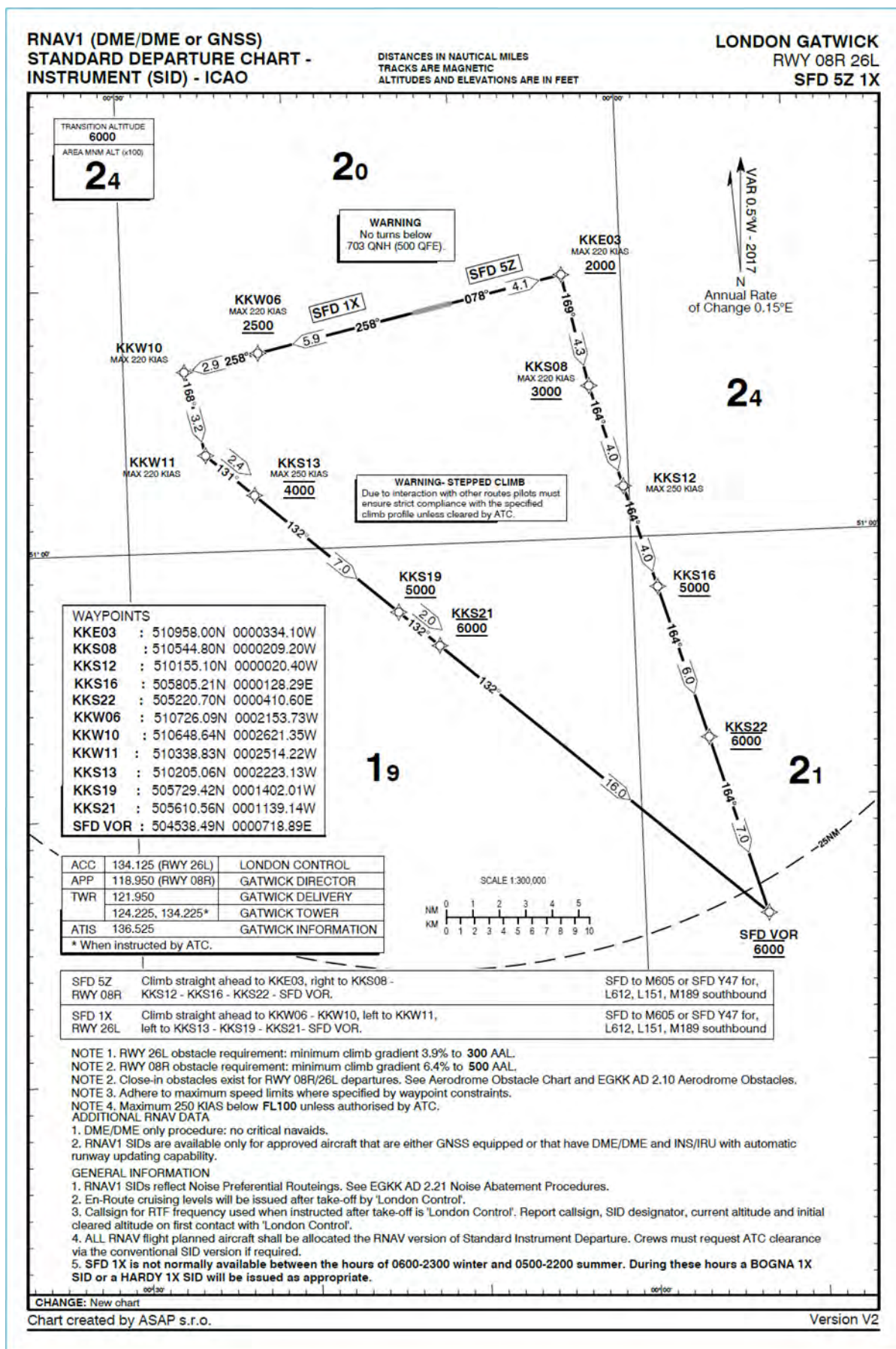
Nominal Track: Blue  
Achieved track: Red  
NPR: Light Green



# Enclosure 1

## FLIGHT VALIDATION REPORT – LONDON GATWICK PROPOSED SFD2Z SID B737-800

### PROCEDURE CHART



# Enclosure 1

## FLIGHT VALIDATION REPORT – LONDON GATWICK PROPOSED SFD2Z SID B737-800

Revised SID with 220KAIS Speed Restriction to KKS08

### London Gatwick Runway 08R SFD 5Z

CL-5176-DOC-005 Issue 2

19/05/2016

Mag Var 0.5W (2017) / annual change 0.15E

#### Database coding

Designator	Sequence Number	Path Terminator	Waypoint Name	Waypoint Co-ordinates	Fly-over	Course / Track °M (°T)	Magnetic Variation	Distance (NM)	Turn Direction	Level Constraint	Speed Constraint	Navigation Performance
SFD 5Z	001	CF	KKE03	51°09'58.00"N / 000°03'34.10"W	N	078° (077.6°)	-0.5	4.1	RIGHT	+2000	-220	RNAV1
SFD 5Z	002	TF	KKS08	51°05'44.80"N / 000°02'09.20"W	N	169° (168.1°)	-0.5	4.3	LEFT	+3000	-220	RNAV1
SFD 5Z	003	TF	KKS12	51°01'55.10"N / 000°00'20.40"W	N	164° (163.4°)	-0.5	4.0	-	-	-250	RNAV1
SFD 5Z	004	TF	KKS16	50°58'05.21"N / 000°01'28.29"E	N	164° (163.4°)	-0.5	4.0	-	+5000	-250	RNAV1
SFD 5Z	005	TF	KKS22	50°52'20.70"N / 000°04'10.60"E	N	164° (163.4°)	-0.5	6.0	-	6000	-250	RNAV1
SFD 5Z	006	TF	SFD	50°45'38.49"N / 000°07'18.89"E	N	164° (163.5°)	-0.5	7.0	-	6000	-250	RNAV1



## Enclosure 1

## FLIGHT VALIDATION REPORT – LONDON GATWICK PROPOSED SFD2Z SID B737-800

SFD  
APPENDIX B

SIMULATOR / FLIGHT VALIDATION REPORT				
<b>Airport Name</b>	LGW GATWICK			
<b>IFP Name</b>				
<b>Validating Pilot</b>	<b>Name</b>	<b>Title</b>	<b>Licence No</b>	<b>Signature</b>
		CAPTAIN		
<b>Aircraft Used</b>	<b>Aircraft Type</b>		<b>Aircraft Registration</b>	
	B737-800W		SIMULATOR CT-630	
<b>RNAV Equipment Used</b>				
<b>Database Provider</b>	AeroNavData			
<b>Chart Provider</b>				
<b>AIRAC Date of Data</b>				
<b>Airport Authority</b>	<b>Name</b>		<b>Appointment</b>	<b>Signature</b>
	GATWICK AIRPORT LIMITED			
<b>Date</b>				

Enclosure 1

FLIGHT VALIDATION REPORT – LONDON GATWICK PROPOSED SFD2Z SID B737-800

APPENDIX B

Pre Flight Checks For RNAV IFP	Requirement	Result	Remarks
	Procedure loaded and activated from an official database?	<input checked="" type="radio"/> Yes / No	
	Waypoint coordinates agree with charted information?	<input checked="" type="radio"/> Yes / No	
	Tracks between waypoints agree with charted information?	<input checked="" type="radio"/> Yes / No	
	Distances between waypoints agree with charted information?	<input checked="" type="radio"/> Yes / No	
	RAIM checked?	<input checked="" type="radio"/> Yes / No	SIMULATION ONLY
	Runway threshold coordinates confirmed? (See note 2 below)	<input checked="" type="radio"/> Yes / No	

## Enclosure 1

## FLIGHT VALIDATION REPORT – LONDON GATWICK PROPOSED SFD2Z SID B737-800

## APPENDIX B

Departure		Requirement	Result	Remarks
		Track keeping acceptable?	<input checked="" type="radio"/> Yes / No	
		Vertical profile/ Climb gradients acceptable?	<input checked="" type="radio"/> Yes / No	
		Turns acceptable/flyable?	<input checked="" type="radio"/> Yes / No	
		Track interceptions (if any) after turn achievable?	<input checked="" type="radio"/> Yes / No	
		Sufficient track guidance available?	<input checked="" type="radio"/> Yes / No	
		Speed restrictions (if any) acceptable?	<input checked="" type="radio"/> Yes / No	NOTE FLAPS HAD TO REMAIN AT 1 (EXTENDED) DURING 220 MAX SPEED TURN AT MAX WEIGHT → SDD LIMIT APPLIED 220KT MANUALLY AT KKS 08
		Speed Limits correctly coded?	<input checked="" type="radio"/> Yes / No	
		Altitude restrictions correctly coded?	<input checked="" type="radio"/> Yes / No	
		Sequencing of waypoints correct?	<input checked="" type="radio"/> Yes / No	
		CDI scale changes activated at appropriate phase of procedure? (See note 3 below)	Yes / No	N/A
		Terminal mode activated at appropriate range? (See note 3 below)	Yes / No	N/A
		Turn anticipation for all waypoints satisfactory?	<input checked="" type="radio"/> Yes / No	
		Stabilisation distances between waypoints satisfactory?	<input checked="" type="radio"/> Yes / No	
		Cockpit workload?	Low / <input checked="" type="radio"/> Medium / High	

Enclosure 1

FLIGHT VALIDATION REPORT – LONDON GATWICK PROPOSED SFD2Z SID B737-800

APPENDIX B

<b>General Comments</b> (Obstacle reporting information if required shall also be stated here):	
SFD SID WITH MAX SPD 220 kts IN THE TURN REQUIRED FLAPS TO REMAIN EXTENDED AT MAX TAKEOFF WEIGHT	
<b>Simulator/Flight Validation Result</b>	<b>Simulator/ Flight Captain</b>
Acceptable	Name & Licence No
Not Acceptable	Signature
Deferred	Date 18-10-16

(\*) - Straight, DME Arc, Hold, Racetrack, Alternative procedure, Procedure turn 45/180 - 80/260, Base Turn. etc

**Note.**

1. Where a report item is not applicable for the procedure being validated, delete as required.
2. If the Runway threshold coordinates cannot be confirmed the validation should be discontinued.
3. Where a procedure has been manually entered into the RNAV system in use, this process will not occur automatically. In this case the validating pilot will need to activate the CDI scaling changes during the different phases of the flight.

Serial 1A – LAM 2X B737

Gross Weight	65000 kg
Surface Wind	Calm
2000 Ft	260/25kts
5000 Ft	290/35kts
Temp	+15C
C of G	20% MAC
Flap	5
KKW02	IAS: 198
	Alt: 3600
	XTT: 0
	Flap 1
	Fuel:
KKE09	IAS: 201
	Alt: 4000
	XTT: 0.01R
	Flap 1
	Fuel:
KKE11	IAS: 234
	Alt: 4020
	XTT: 0.01R
	Flap 0
	Fuel:
Notes: Max XTT 0.04L&R around turn Flap 1 Required at 200kts 30°AOB achieved	



Serial 2A – LAM 2X B737

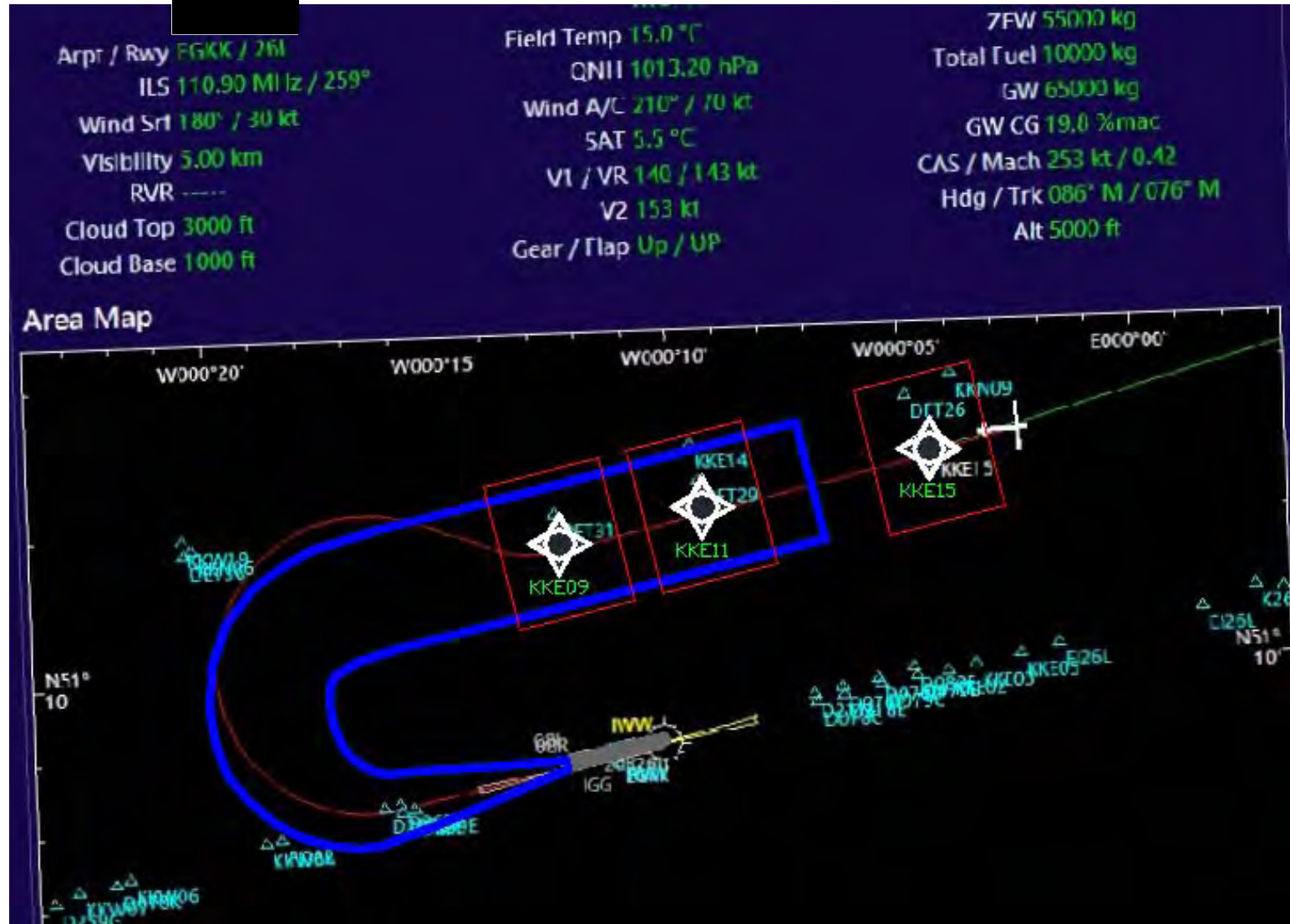
Gross Weight	79000 kg
Surface Wind	Calm
2000 Ft	260/25kts
5000 Ft	290/35kts
Temp	+15C
C of G	20% MAC
Flap	5
KKW02	IAS: 197
	Alt: 2580
	XTT: 0.04R
	Flap 5
	Fuel: 148T ps/hr
KKE09	IAS: 201
	Alt: 4000
	XTT: 0.02R
	Flap 1
	Fuel:
KKE11	IAS: 230
	Alt: 4000
	XTT: 0
	Flap 0
	Fuel:
Notes: Max XTT 0.04R around turn Flap 5 Required at 200kts 30°AOB achieved	





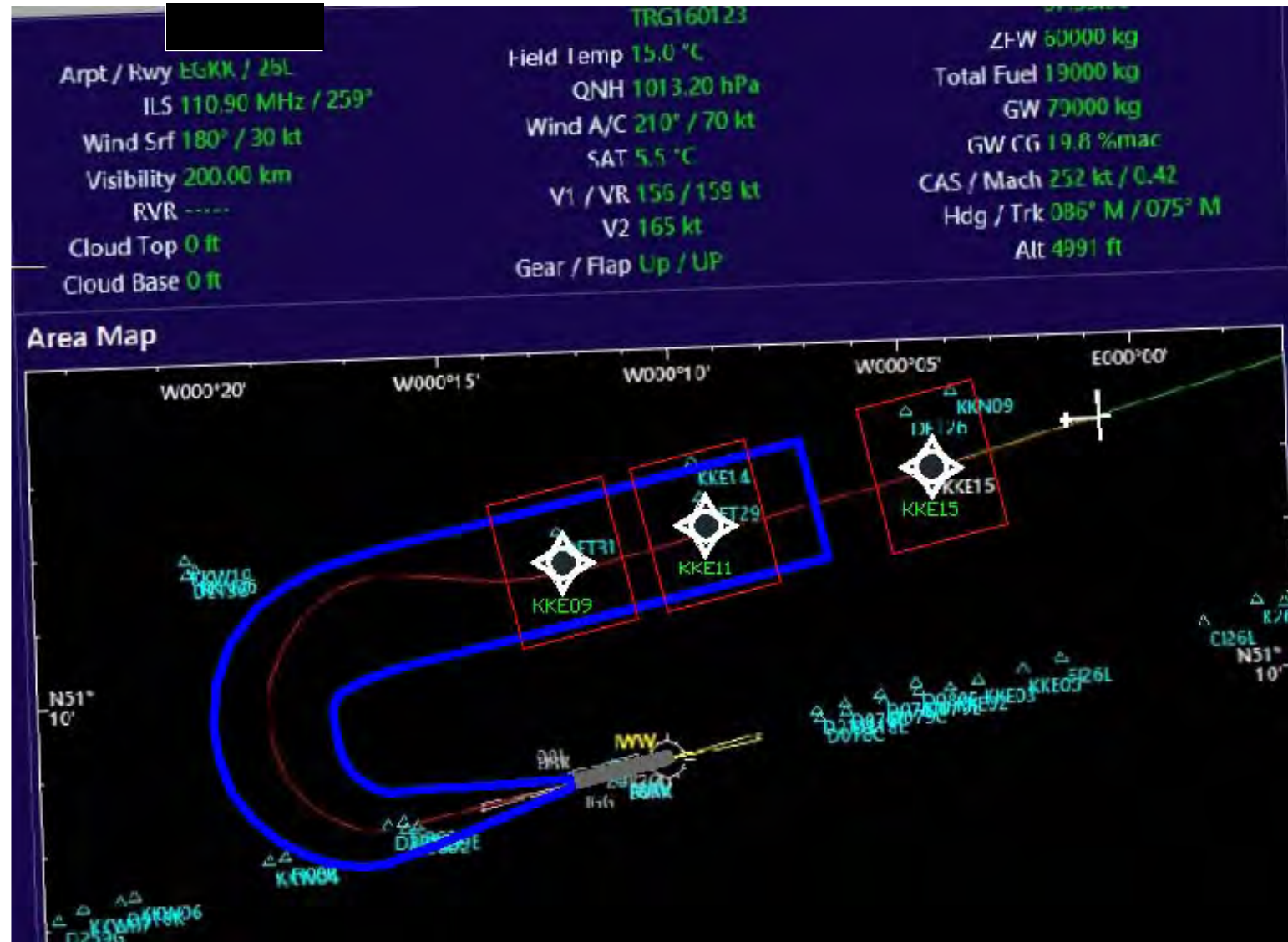
Serial 3A – LAM 2X B737

Gross Weight	65000 kg
Surface Wind	180/30kts
2000 Ft	180/50kts
5000 Ft	210/70kts
Temp	+15C
C of G	20% MAC
Flap	5
KKW02	IAS: 204
	Alt: 3450
	XTT: 0
	Flap 1
	Fuel: ps/hr
KKE09	IAS: 207
	Alt: 4000
	XTT: 0.03R
	Flap 0
	Fuel:
KKE11	IAS: 239
	Alt: 4100
	XTT: 0.03R
	Flap 0
	Fuel:
Notes:	
Max XTT 0.05R around turn	
Flap 1 Required at 200kts	
30°AOB achieved	



Serial 4A – LAM 2X B737

Gross Weight	79000 kg
Surface Wind	180/30kts
2000 Ft	180/50kts
5000 Ft	210/70kts
Temp	+15C
C of G	20% MAC
Flap	5
KKW02	IAS: 202
	Alt: 2560
	XTT: 0
	Flap 5
	Fuel: ps/hr
KKE09	IAS: 201
	Alt: 4000
	XTT: 0.12R
	Flap 1
	Fuel:
KKE11	IAS: 232
	Alt: 4000
	XTT: 0.08R
	Flap 0
	Fuel:
Notes:	
Max XTT 0.51L around turn	
Flap 5 Required at 200kts	
30°AOB achieved	



Serial 5A – LAM 2X B737

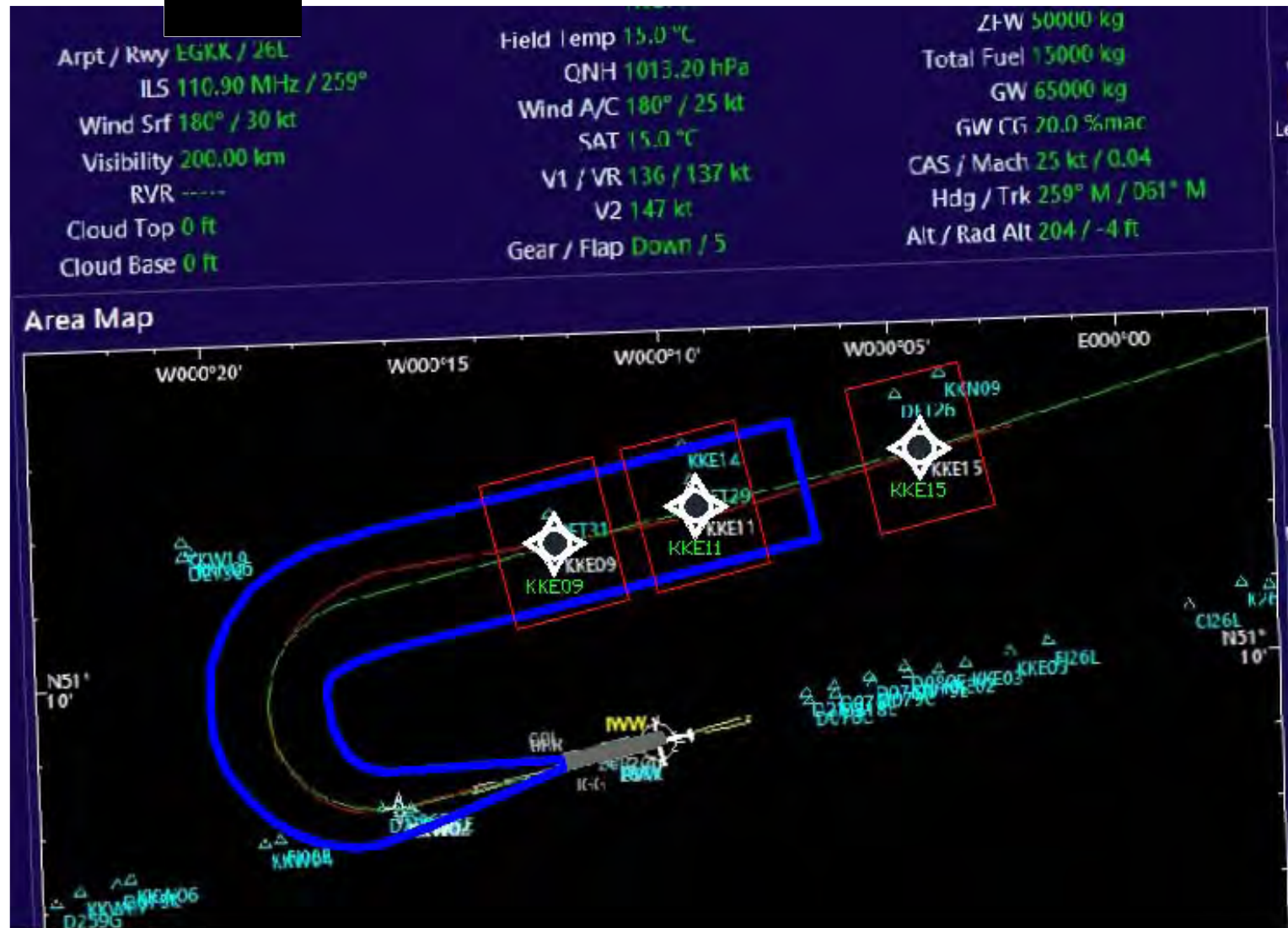
Gross Weight	57500 kg
Surface Wind	180/30kts
2000 Ft	180/50kts
5000 Ft	210/70kts
Temp	+15C
C of G	20% MAC
Flap	5
KKW02	IAS: 201
	Alt: 3680
	XTT: 0
	Flap 0
	Fuel: ps/hr
KKE09	IAS: 205
	Alt: 4000
	XTT: 0.03R
	Flap 0
	Fuel:
KKE11	IAS: 242
	Alt: 4060
	XTT: 0.02R
	Flap 0
	Fuel:
Notes:	
Max XTT 0.05R around turn	
Flap 0 Required at 200kts	
30°AOB achieved	



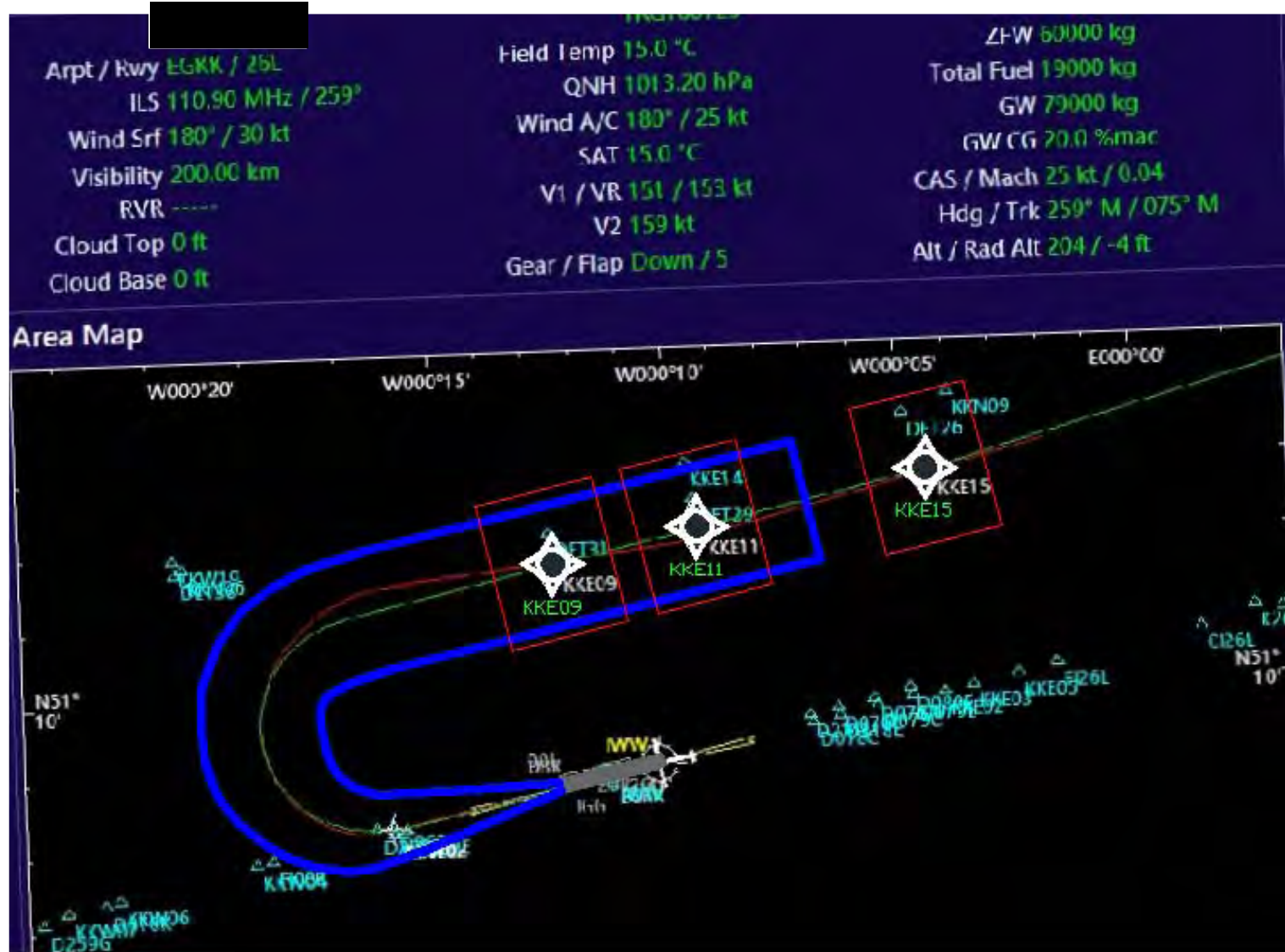


Serial 6A – LAM 2X B737

Gross Weight	65000 kg
Surface Wind	180/30kts
2000 Ft	210/50kts
5000 Ft	240/70kts
Temp	+15C
C of G	20% MAC
Flap	5
KKW02	IAS: 198
	Alt: 3920
	XTT: 0
	Flap 1
	Fuel: ps/hr
KKE09	IAS: 201
	Alt: 4000
	XTT: 0.05R
	Flap 0
	Fuel:
KKE11	IAS: 237
	Alt: 4060
	XTT: 0.11R
	Flap 0
	Fuel:
Notes:	
Max XTT 0.32L around turn	
Flap 1 Required at 200kts	
30°AOB achieved	



Gross Weight	79000 kg
Surface Wind	180/30kts
2000 Ft	210/50kts
5000 Ft	240/70kts
Temp	+15C
C of G	20% MAC
Flap	5
KKW02	IAS: 200
	Alt: 3040
	XTT: 0
	Flap 5
	Fuel: ps/hr
KKE09	IAS: 204
	Alt: 4000
	XTT: 0.07R
	Flap 1 – 0
	Fuel:
KKE11	IAS: 230
	Alt: 4020
	XTT: 0.1R
	Flap 0
	Fuel:
Notes:	
Max XTT 0.29L around turn	
Flap 5 Required at 200kts	
30°AOB achieved	



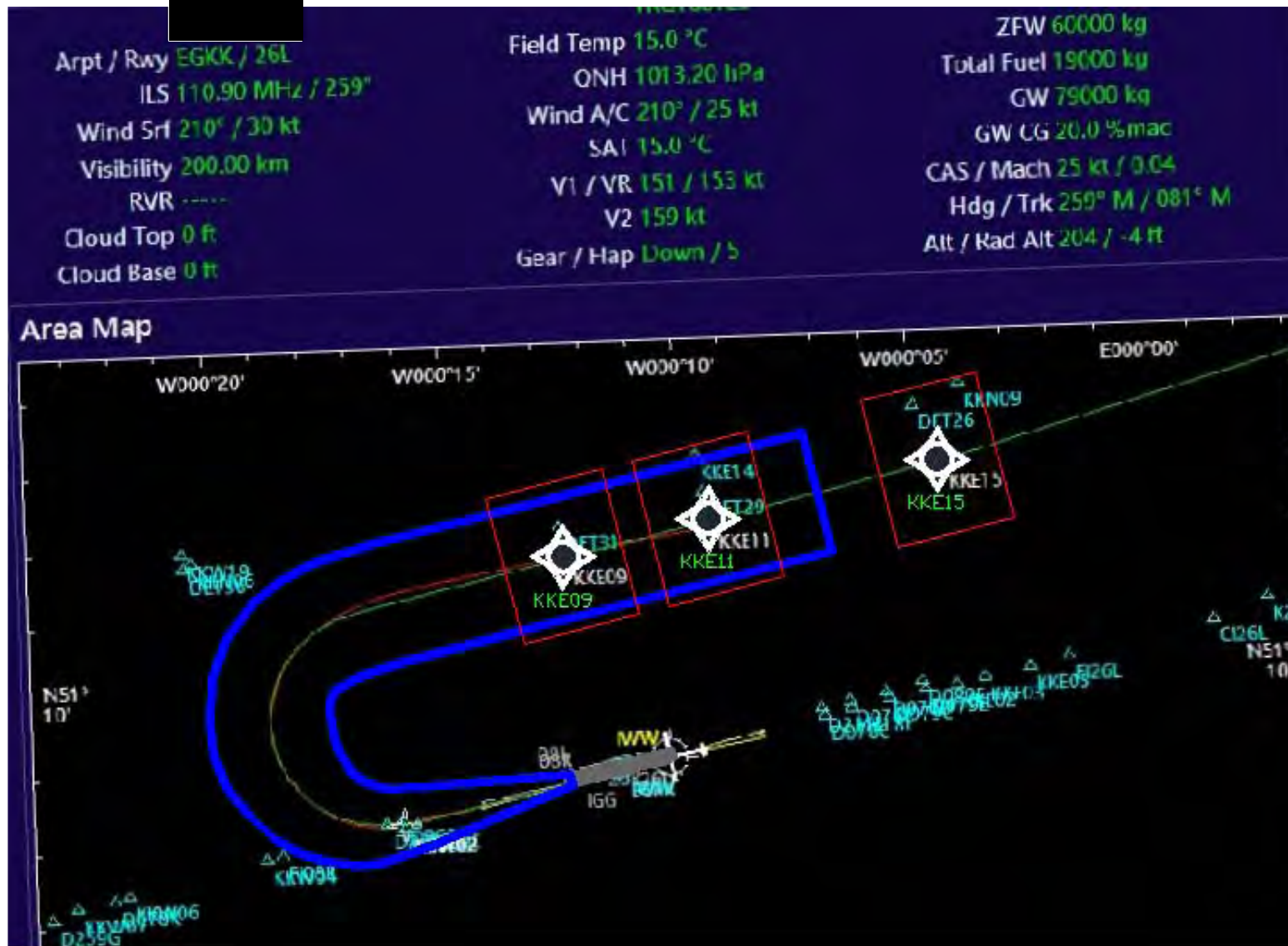
Serial 8A – LAM 2X B737

Gross Weight	65000 kg
Surface Wind	210/30kts
2000 Ft	240/50ts
5000 Ft	270/70kts
Temp	+15C
C of G	20% MAC
Flap	5
KKW02	IAS: 199
	Alt: 4000
	XTT: 0
	Flap 1
	Fuel: ps/hr
KKE09	IAS: 200
	Alt: 4000
	XTT: 0.02R
	Flap 0
	Fuel:
KKE11	IAS: 217
	Alt: 4000
	XTT: 0.05R
	Flap 0
	Fuel:
Notes: Max XTT 0.16L around turn Flap 1 Required at 200kts 30°AOB achieved	





Gross Weight	79000 kg
Surface Wind	210/30kts
2000 Ft	240/50kts
5000 Ft	270/70kts
Temp	+15C
C of G	20% MAC
Flap	5
KKW02	IAS: 197
	Alt: 2580
	XTT: 0.04R
	Flap 5
	Fuel: 1.58T ps/hr
KKE09	IAS: 201
	Alt: 4000
	XTT: 0.02R
	Flap 5
	Fuel:
KKE11	IAS: 230
	Alt: 4000
	XTT: 0
	Flap 0
	Fuel:
Notes: Max XTT 0.20L around turn Flap 5 Required at 200kts 30°AOB achieved	



11/11/2016

Arpt / Rwy **EGKK / 26L**  
 ILS **110.90 MHz / 259°**  
 Wind Srf **240° / 30 kt**  
 Visibility **200.00 km**  
 RVR **-----**  
 Cloud Top **0 ft**  
 Cloud Base **0 ft**

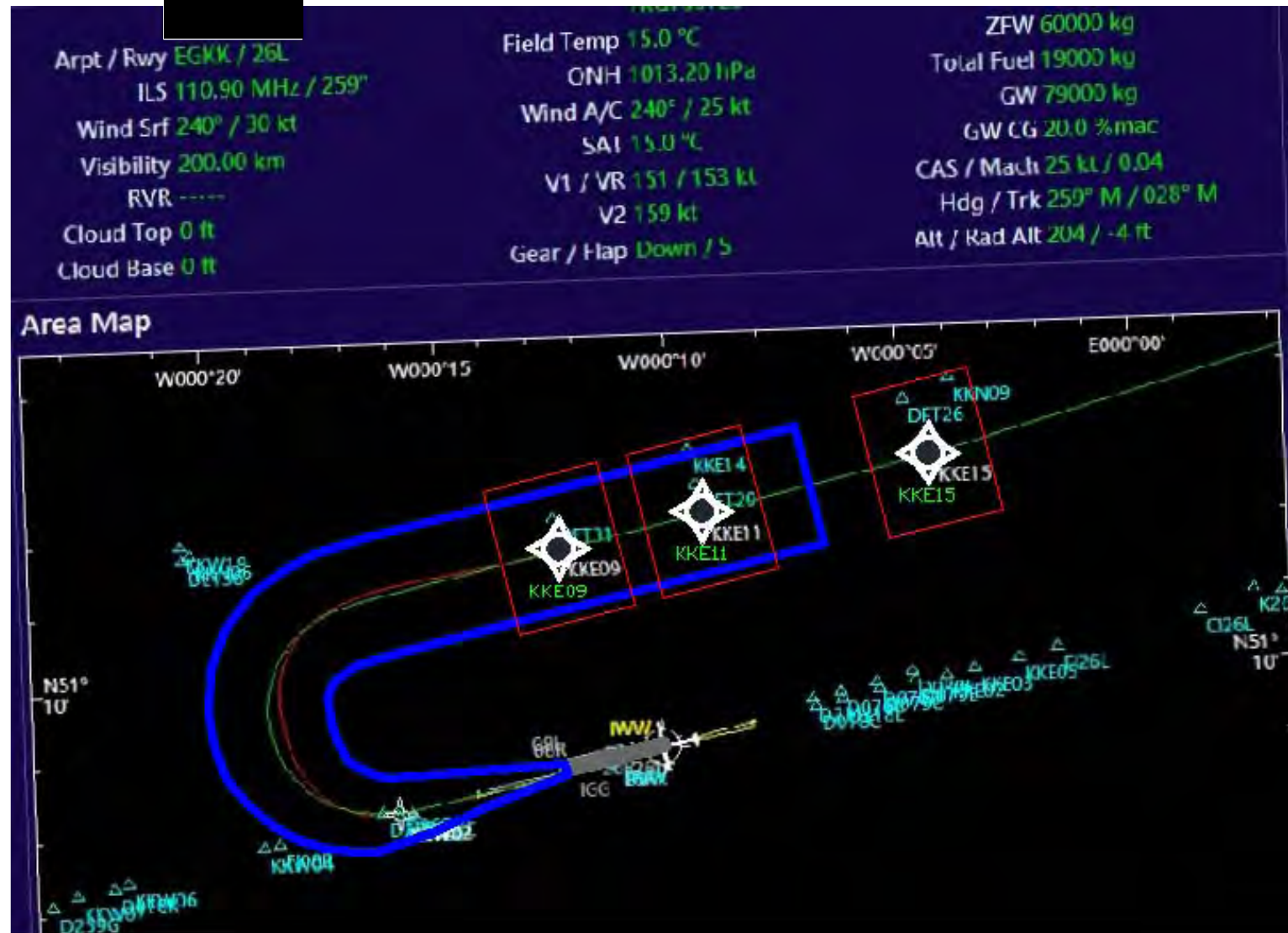
Field Temp **15.0 °C**  
 ONH **1013.20 hPa**  
 Wind A/C **240° / 25 kt**  
 SAT **15.0 °C**  
 V1 / VR **137 / 137 kt**  
 V2 **147 kt**  
 Gear / Hap **Down / 5**

ZFW **50000 kg**  
 Total Fuel **15000 kg**  
 GW **65000 kg**  
 GW CG **20.0 %mac**  
 CAS / Mach **25 kt / 0.04**  
 Hdg / Trk **259° M / 002° M**  
 Alt / Rad Alt **204 / -4 ft**

### Area Map

Serial 11A – LAM 2X B737

Gross Weight	79000 kg
Surface Wind	240/30kts
2000 Ft	270/50kts
5000 Ft	300/70kts
Temp	+15C
C of G	20% MAC
Flap	5
KKW02	IAS: 202
	Alt: 3320
	XTT: 0
	Flap 5
	Fuel: ps/hr
KKE09	IAS: 201
	Alt: 4000
	XTT: 0.02R
	Flap 5
	Fuel:
KKE11	
Notes:	
Max XTT 0.12L around turn	
Flap 5 Required at 200kts	
30°AOB achieved	





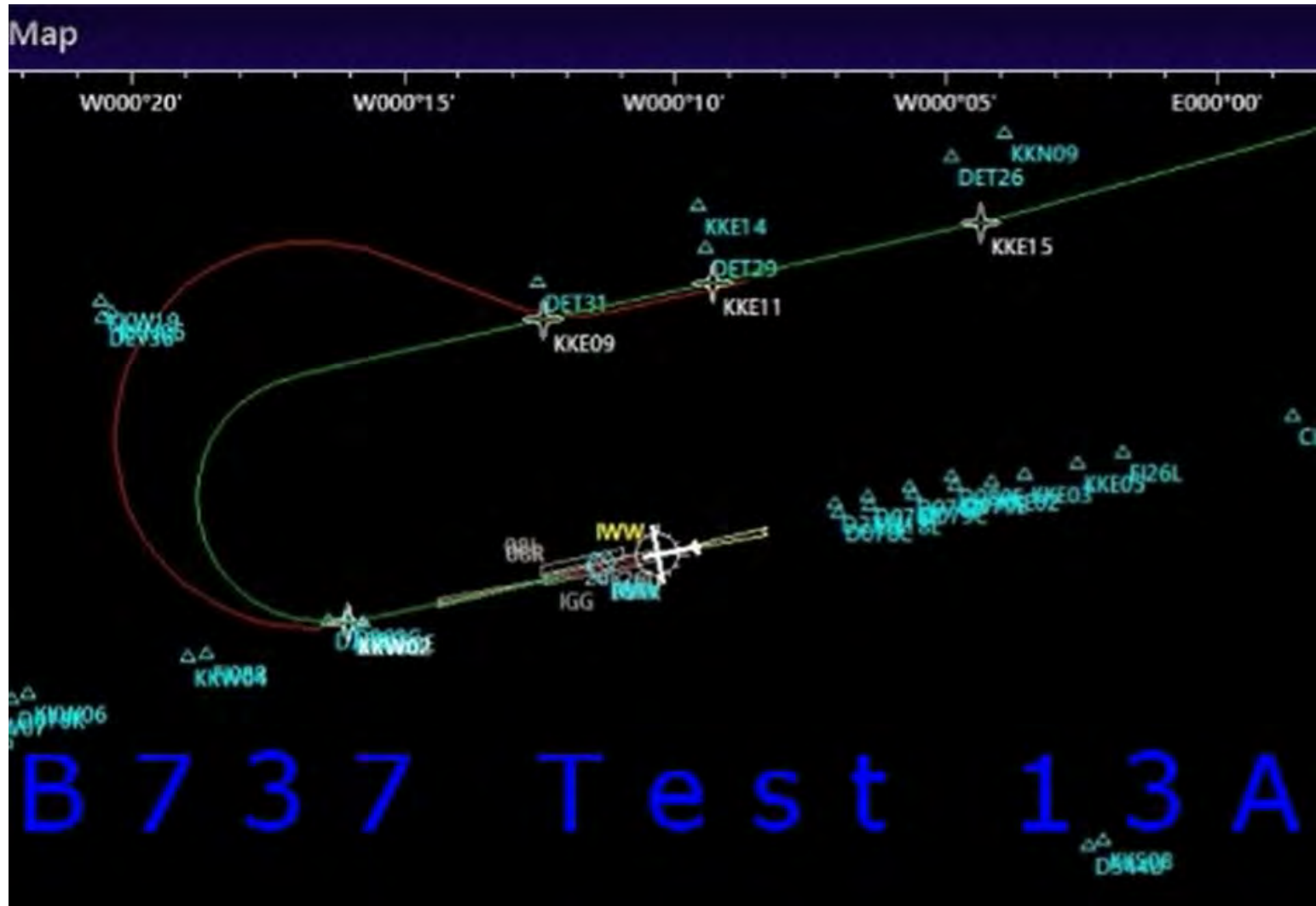
Serial 12A – LAM 2X B737

Gross Weight	65000 kg
Surface Wind	290/30kts
2000 Ft	320/50kts
5000 Ft	350/70kts
Temp	+15C
C of G	20% MAC
Flap	5
KKW02	IAS: 201
	Alt: 2580
	XTT: 0
	Flap 1
	Fuel: ps/hr
KKE09	IAS: 201
	Alt: 4000
	XTT: 0.02R
	Flap 1
	Fuel:
KKE11	
Notes:	
Max XTT 0.03L around turn	
Flap 1 Required at 200kts	
30°AOB achieved	



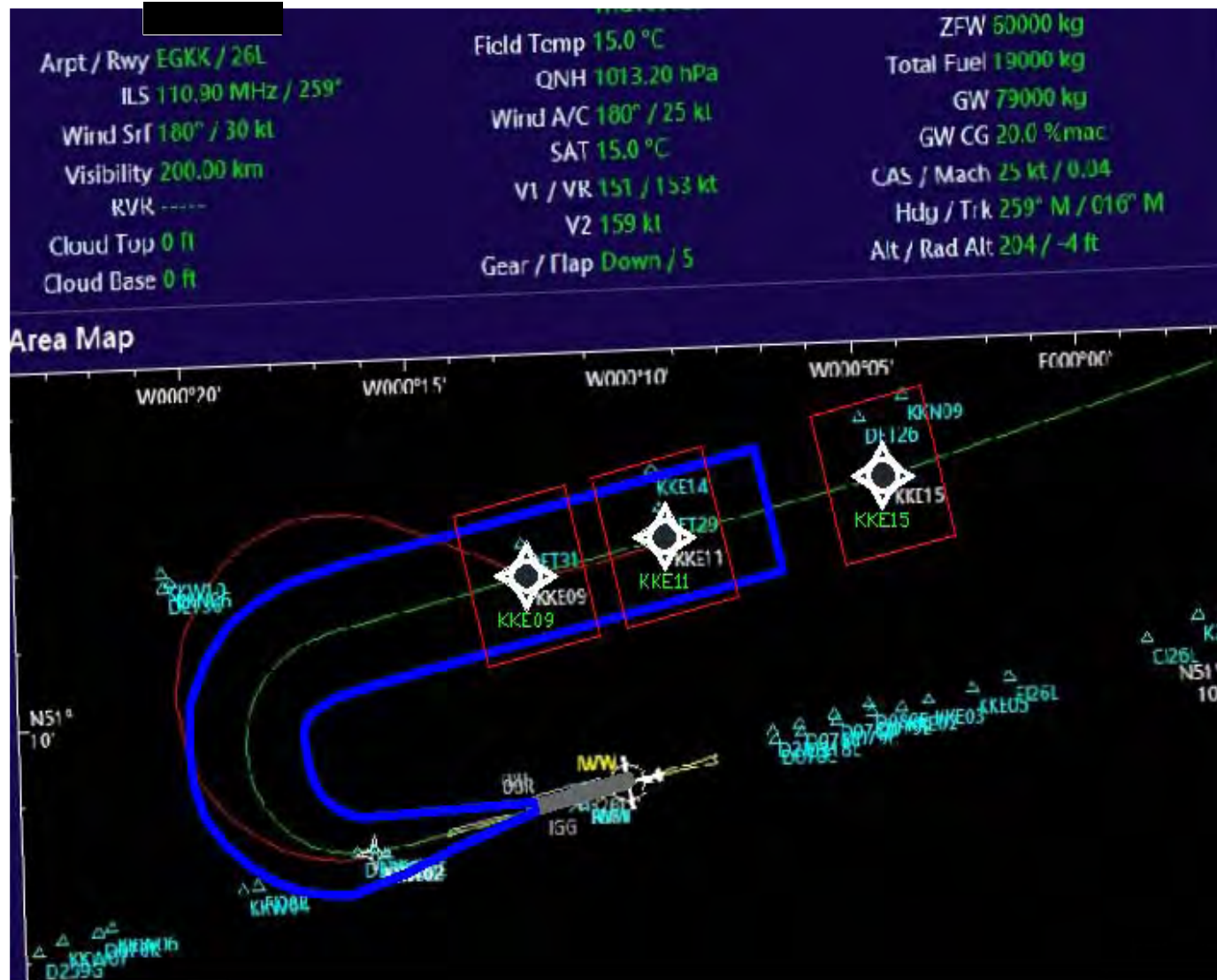
Serial 13A – **LAM 3X** B737

Gross Weight	65000 kg
Surface Wind	180/30kts
2000 Ft	180/50kts
5000 Ft	210/70kts
Temp	+15C
C of G	20% MAC
Flap	5
KKW02	IAS: 221
	Alt: 3080
	XTT: 0
	Flap 0
	Fuel: ps/hr
KKE09	IAS: 225
	Alt: 4000
	XTT: 0.06R
	Flap 0
	Fuel:
KKE11	
Notes: Max XTT 0.02L around turn Flap 0 Required at 220kts 30°AOB achieved	





Gross Weight	79000 kg
Surface Wind	180/30kts
2000 Ft	180/50kts
5000 Ft	210/70kts
Temp	+15C
C of G	20% MAC
Flap	5
KKW02	IAS: 197
	Alt: 2200
	XTT: 0.02L
	Flap 1
	Fuel: ps/hr
KKE09	IAS: 201
	Alt: 4000
	XTT: 0.04L
	Flap 1
	Fuel:
KKE11	
Notes:	
Max XTT 0.04R around turn	
Flap 0 Required at 220kts	
30°AOB achieved	



ACT	RTE	LEGS	1/2
79°		6. 5NM	
KKE04		250B/	2000A
92°		7. 2NM	
KKE10		250B/	3000A
90°		6. 6NM	
KKE17		250B/	5000
90°		7. 9NM	
KKE25		250B/	5000
14°		8. 2NM	
DET		250B/	5000
RNP/ACTUAL-----			
1. 00/0. 07NM		RTE DATA>	



SID NAME	CLN 2Z				
AIRCRAFT/SIM TYPE	B737 CT630				
FLIGHT/SIM RUN No:	T/OFF WT XX000KG	QNH	TEMP °C	W/V Kts	Wind Level
Run 1B	65000	1013.2	+30	Calm	Surface
V1 135					1000
V2 147				120/15	2000
VR 138					3000
					4000
Full run to KKN52 undertaken to prove that existing SID				150/25	5000

Full run to KKN52 undertaken to prove that existing SID beyond KKE17 had not been affected by Track change between KKE04 and KKE10

No anomalies noted

### ASSESSMENT REQUIREMENTS (But not limited to)

Turn Anticipation Acceptable

5

20% MAC

## WAYPOINT

[illegible]



Nominal Track: Blue  
Achieved track: Red  
NPR: Light Green



SID NAME	CLN 2Z				
AIRCRAFT/SIM TYPE	B737 CT630				
FLIGHT/SIM RUN No:	T/OFF WT XX000KG	QNH	TEMP °C	W/V Kts	Wind Level
Run 2B	79000	1013.2	+30	Calm	Surface
V1 158					1000
V2 162				120/15	2000
VR 159					3000
					4000
				150/25	5000

[illegible]



Nominal Track: Blue

Achieved track: Red

NPR: Light Green

SID NAME	CLN 2Z					
AIRCRAFT/SIM TYPE	B737 CT630					
FLIGHT/SIM RUN No:	T/OFF WT XX000KG	QNH	TEMP °C	W/V Kts	Wind Level	
Run 3B	65000	1013.2	+30	080/30	Surface	
V1 143					1000	
V2 153				110/50	2000	
VR 143					3000	
					4000	
				140/70	5000	

[illegible]



Nominal Track: Blue  
Achieved track: Red  
NPR: Light Green

SID NAME	CLN 2Z				
AIRCRAFT/SIM TYPE	B737 CT630				
FLIGHT/SIM RUN No:	T/OFF WT XX000KG	QNH	TEMP °C	W/V Kts	Wind Level
Run 4B	79000	1013.2	+30	080/30	Surface
V1 159					1000
V2 165				110/50	2000
VR 159					3000
					4000
				140/70	5000

[illegible]





Nominal Track: Blue

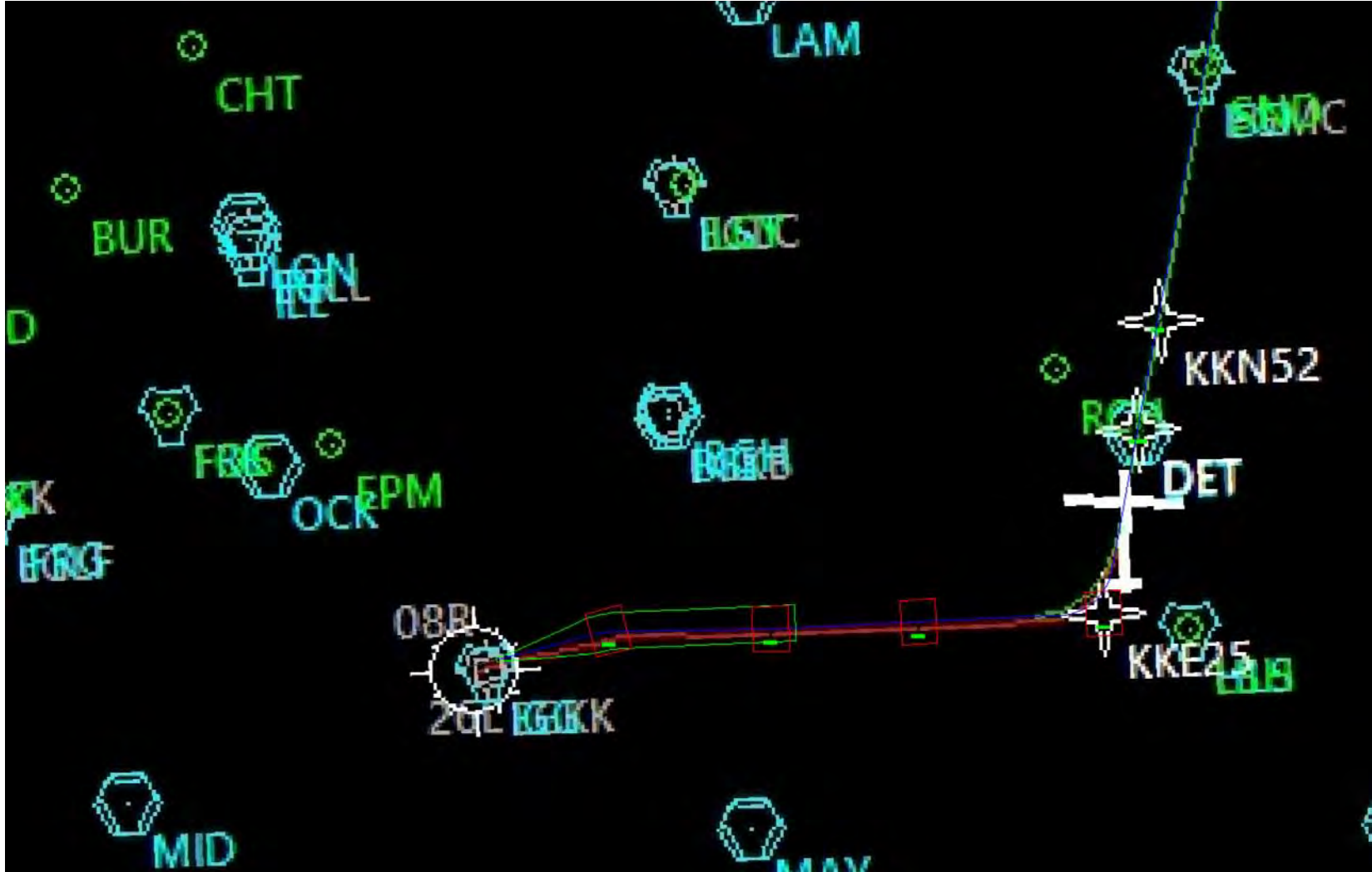
Achieved track: Red

NPR: Light Green

SID NAME	CLN 2Z				
AIRCRAFT/SIM TYPE	B737 CT630				
FLIGHT/SIM RUN No:	T/OFF WT XX000KG	QNH	TEMP °C	W/V Kts	Wind Level
Run 5B	65000	1013.2	+30	170/30	Surface
V1 135					1000
V2 138				200/50	2000
VR 147					3000
					4000
Run to KKN25 undertaken to prove that SID beyond				230/70	5000

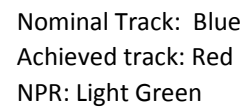
Run to KKN25 undertaken to prove that SID beyond KKE17 is not unduly affected by strong cross wind. No anomalies noted

[illegible]



Nominal Track: Blue  
Achieved track: Red  
NPR: Light Green







SID NAME	CLN ZZ				
AIRCRAFT/SIM TYPE	B737 CT630				
FLIGHT/SIM RUN No:	T/OFF WT XX000KG	QNH	TEMP °C	W/V Kts	Wind Level
Run 7B	65000	1013.2	+30	350/30	Surface
V1 140					1000
V2 153				320/50	2000
VR 143					3000
					4000
				290/70	5000
Due simulator time availability runs shortened to cover					

Due simulator time availability runs shortened to cover only those waypoints modified

[illegible]



Nominal Track: Blue  
Achieved track: Red  
NPR: Light Green

SID NAME	CLN 2Z				
AIRCRAFT/SIM TYPE	B737 CT630				
FLIGHT/SIM RUN No:	T/OFF WT XX000KG	QNH	TEMP °C	W/V Kts	Wind Level
Run 8B	79000	1013.2	+30	350/30	Surface
V1 156					1000
V2 165				320/50	2000
VR 159					3000
					4000
				290/70	5000
Due simulator time availability runs shortened to cover					

Due simulator time availability runs shortened to cover only those waypoints modified

[illegible]



Nominal Track: Blue

Achieved track: Red

NPR: Light Green