

Flight Procedures Cover Page	Task Action: FLIGHT CHECK	Task Type: STAR	Estimated Chart Date: 07/11/2024	APWS Task ID: 8E60A1C795E84639A55C39E048FF5ACF	APWS Project ID: 0F97B6C4C9284E4E97293D23026E651B
Procedure: STAR MBELL FIVE (RNAV) LOUISVILLE KY KSDF		Enroute: YES	Specialist: Johnson, Raymond		Agreement Number:
Airport ID: KSDF			Airport City: LOUISVILLE		State: KY
Facility ID:	Facility Type:	Flight Inspection Remark Type: New FC Slot			
<div>Procedure Comments: PROCEDURE COMPLETED USING ACTIVE AIRNAV AIRPORT DATA  LOA (1): DG/DECEL  CONTACT MIKE GARRITY AJV_A423 MANAGER 405-550-3958.</div>					

<b>FIPC DME/DME FORM</b>									
<b>PROCEDURE:</b> STAR MBELL FIVE (RNAV) LOUISVILLE KY KSDF				<b>AIRPORT NAME:</b> LOUISVILLE MUHAMMAD ALI INTL		<b>AIRPORT ID:</b> KSDF		<b>SPECIAL CONTROL NO:</b> AG-04-031-24	
<b>FAC ID:</b> MBELL5			<b>CITY:</b> LOUISVILLE			<b>ST:</b> KY		<b>ORIG CHART DATE:</b> 07/11/2024	
<b>DFL TYPE:</b> PROC/D		<b>THIRD PARTY:</b> <input type="checkbox"/> YES		<b>EST. TIME ON SITE:</b> 1.0		<b>REIMB. NUMBER:</b>		<b>PTS TASK ID:</b> 8E60A1C795E84639A55C39E048FF5ACF	
<b>PREFLIGHT NOTES</b>									
<b>REVIEWER:</b>						<b>DATE:</b>			
<b>COMMENTS:</b>						<b>CHECK ONE:</b> <input type="checkbox"/> FLT CK REQ <input type="checkbox"/> NFCR <input type="checkbox"/> REJECT <div style="display: flex; justify-content: flex-end; align-items: center; gap: 10px;"> <div style="border-top: 1px solid black; width: 150px;"></div> <div style="border-top: 1px solid black; width: 40px; text-align: center;">YES</div> <div style="border-top: 1px solid black; width: 40px; text-align: center;">NO</div> </div>			
						<b>CPV COMPLETE?</b>		X	
<b>PROCEDURE RESULTS</b>									
<b>INSPECTION DATE:</b> 04/25/2024		<b>CREW #:</b> VN327		<b>N #:</b> N79		<b>INSTRUMENT PROCEDURE STATUS:</b> <input checked="" type="checkbox"/> SAT <input type="checkbox"/> SAT W/CHANGES <input type="checkbox"/> UNSAT		<b>ARINC CODING:</b> <input checked="" type="checkbox"/> SAT <input type="checkbox"/> SAT/GOLD <input type="checkbox"/> UNSAT	
<b>FLIGHT INSPECTOR SIGNATURE:</b> jeffrey eckman @ 04/26/2024 17:54				<b>PRINTED NAME:</b> ECKMAN, JEFFREY ALAN				<b>NOTAM INITIATED?</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
<b>FLIGHT INSPECTOR REMARKS:</b> Procedure is SAT as proposed.									
<b>DME/DME STATUS:</b> <input checked="" type="checkbox"/> SAT <input type="checkbox"/> UNSAT		<b>SPECIALIST SIGNATURE:</b> steven s-ctr rager @ 05/16/2024 07:18				<b>PRINTED NAME:</b> Steven Rager			
<b>SPECIALIST REMARKS:</b> Post Flight DME/DME Analysis has been performed on the KSDF MBELL5 STAR with satisfactory results. All modeled DME's and ESV's were recorded by Flight Inspection or certified with TARGETS and are suitable for DME/DME/IRU operations.									
<b>IN-FLIGHT OBSTACLE REPORT</b>									
<b>OBSTRUCTION ID #:</b>		<b>COORDINATES OR LOCATION:</b>		<b>GNSS ALTITUDE (MSL):</b>		<b>BAROMETRIC ALTITUDE (MSL):</b>		<b>HEIGHT ABOVE GROUND LEVEL:</b>	

FIPC DME/DME FORM									
PROCEDURE: STAR MBELL FIVE (RNAV) LOUISVILLE KY KSDF				AIRPORT NAME: LOUISVILLE MUHAMMAD ALI INTL		AIRPORT ID: KSDF		SPECIAL CONTROL NO: AG-04-031-24	
FAC ID: MBELL5			CITY: LOUISVILLE			ST: KY		ORIG CHART DATE: 07/11/2024	
DFL TYPE: PROC/D	THIRD PARTY: <input type="checkbox"/> YES	EST. TIME ON SITE: 1.0	REIMB. NUMBER:		PTS TASK ID: 8E60A1C795E84639A55C39E048FF5ACF				
PREFLIGHT NOTES									
REVIEWER:						DATE:			
COMMENTS:						CHECK ONE: <input type="checkbox"/> FLT CK REQ <input type="checkbox"/> NFCR <input type="checkbox"/> REJECT			
								YES	NO
						CPV COMPLETE?		X	
PROCEDURE RESULTS									
INSPECTION DATE: 04/25/2024		CREW #: VN327	N #: N79	INSTRUMENT PROCEDURE STATUS: <input checked="" type="checkbox"/> SAT <input type="checkbox"/> SAT W/CHANGES <input type="checkbox"/> UNSAT			ARINC CODING: <input checked="" type="checkbox"/> SAT <input type="checkbox"/> SAT/GOLD <input type="checkbox"/> UNSAT		
FLIGHT INSPECTOR SIGNATURE: jeffrey eckman @ 04/26/2024 17:54			PRINTED NAME: ECKMAN, JEFFREY ALAN					NOTAM INITIATED? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
FLIGHT INSPECTOR REMARKS: Procedure is SAT as proposed.									
DME/DME STATUS: <input type="checkbox"/> SAT <input type="checkbox"/> UNSAT		SPECIALIST SIGNATURE:				PRINTED NAME:			
SPECIALIST REMARKS:									
IN-FLIGHT OBSTACLE REPORT									
OBSTRUCTION ID #:	COORDINATES OR LOCATION:		GNSS ALTITUDE (MSL):		BAROMETRIC ALTITUDE (MSL):		HEIGHT ABOVE GROUND LEVEL:		

FIPC BASIC FORM									
PROCEDURE: STAR MBELL FIVE (RNAV) LOUISVILLE KY KSDF				AIRPORT NAME: LOUISVILLE MUHAMMAD ALI INTL		AIRPORT ID: KSDF		SPECIAL CONTROL NO: AG-04-031-24	
FAC ID: MBELL5			CITY: LOUISVILLE			ST: KY		ORIG CHART DATE: 07/11/2024	
DFL TYPE: PROC/D	THIRD PARTY: <input type="checkbox"/> YES	EST. TIME ON SITE: 1.0	REIMB. NUMBER:		PTS TASK ID: 8E60A1C795E84639A55C39E048FF5ACF				
PREFLIGHT NOTES									
REVIEWER:						DATE:			
COMMENTS:						CHECK ONE: <input type="checkbox"/> FLT CK REQ <input type="checkbox"/> NFCR <input type="checkbox"/> REJECT			
								YES	NO
						CPV COMPLETE?		X	
PROCEDURE RESULTS									
INSPECTION DATE: 04/25/2024		CREW #: VN327	N #: N79	INSTRUMENT PROCEDURE STATUS: <input checked="" type="checkbox"/> SAT <input type="checkbox"/> SAT W/CHANGES <input type="checkbox"/> UNSAT			ARINC CODING: <input checked="" type="checkbox"/> SAT <input type="checkbox"/> SAT/GOLD <input type="checkbox"/> UNSAT		
FLIGHT INSPECTOR SIGNATURE: jeffrey eckman @ 04/26/2024 17:54				PRINTED NAME: ECKMAN, JEFFREY ALAN				NOTAM INITIATED? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
FLIGHT INSPECTOR REMARKS: Procedure is SAT as proposed.									
IN-FLIGHT OBSTACLE REPORT									
OBSTRUCTION ID #:		COORDINATES OR LOCATION:		GNSS ALTITUDE (MSL):		BAROMETRIC ALTITUDE (MSL):		HEIGHT ABOVE GROUND LEVEL:	



(JIIINN.MBELL5) FIG

## MBELL FIVE ARRIVAL (RNAV)

LOUISVILLE, KENTUCKY

LOUISVILLE APP CON  
132.075 327.0  
SDF D-ATIS  
118.725  
LOU ATIS  
124.15

PROTOTYPE-NOT FOR NAVIGATION

NOTE: Jet aircraft only.

NOTE: PENBE Transition ATC assigned only.

NOTE: KSDF landing north select Rwy 35L Transition.

Expect runway assignment from LOUISVILLE  
APP CON prior to JIINN.

NOTE: KSDF landing south select Rwy 17R Transition.

Expect runway assignment from LOUISVILLE  
APP CON prior to JIINN.

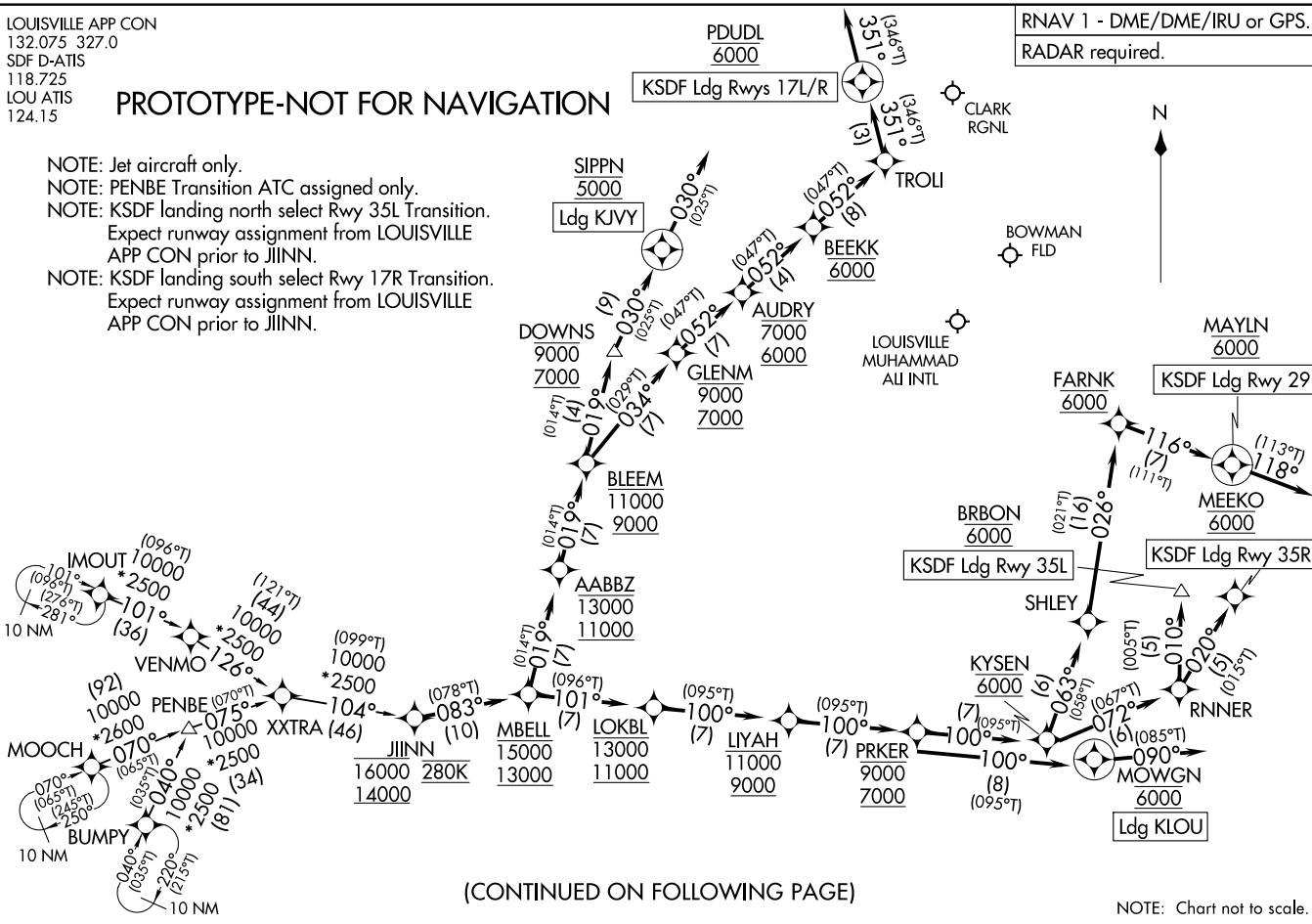
RNAV 1 - DME/DME/IRU or GPS.

RADAR required.

(J1INN.MBELL5) FIG  
MBELL FIVE ARRIVAL (RNAV)

AL-239 (FAA)

LOUISVILLE, KENTUCKY



NOTE: Chart not to scale.

# ARRIVAL ROUTE DESCRIPTION

BUMPY TRANSITION (BUMPY.MBELL5)

IMOUT TRANSITION (IMOUT.MBELL5)

MOOCH TRANSITION (MOOCH.MBELL5)

PENBE TRANSITION (PENBE.MBELL5)

KSDF: From JIINN on track 083° to cross MBELL between 13000 and 15000.

LANDING KSDF RUNWAY 17L/R: From MBELL on track 019° to cross AABZ between 11000 and 13000, then on track 019° to cross BLEEM between 9000 and 11000, then on track 034° to cross GLENM between 7000 and 9000, then on track 052° to cross AUDRY between 6000 and 7000, then on track 052° to cross BEEKK at 6000, then on track 052° to TROLL, then on track 351° to cross PDUDL at 6000, then on track 351°. Expect RADAR vectors to final approach course.

LANDING KSDF RUNWAY 29: From MBELL on track 101° to cross LOKBL between 11000 and 13000, then on track 100° to cross LIYAH between 9000 and 11000, then on track 100° to cross PRKER between 7000 and 9000, then on track 100° to cross KYSEN at 6000, then on track 063° to SHLEY, then on track 026° to cross FARNK at 6000, then on track 116° to cross MAYLN at 6000, then on track 118°. Expect RADAR vectors to final approach course.

LANDING KSDF RUNWAY 35L: From MBELL on track 101° to cross LOKBL between 11000 and 13000, then on track 100° to cross LIYAH between 9000 and 11000, then on track 100° to cross PRKER between 7000 and 9000, then on track 100° to cross KYSEN at 6000, then on track 072° to RNNER, then on track 010° to cross BRBON at 6000. Expect ILS or LOC RWY 35L approach.

LANDING KSDF RUNWAY 35R: From MBELL on track 101° to cross LOKBL between 11000 and 13000, then on track 100° to cross LIYAH between 9000 and 11000, then on track 100° to cross PRKER between 7000 and 9000, then on track 100° to cross KYSEN at 6000, then on track 072° to RNNER, then on track 020° to cross MEEKO at 6000. Expect ILS or LOC RWY 35R approach.

LANDING KJVY: From JIINN on track 083° to cross MBELL between 13000 and 15000, then on track 019° to cross AABZ between 11000 and 13000, then on track 019° to cross BLEEM between 9000 and 11000, then on track 019° to cross DOWNS between 7000 and 9000, then on track 030° to cross SIPPN at 5000, then on track 030°. Expect RADAR vectors to final approach course.

LANDING KLOU: From JIINN on track 083° to cross MBELL between 13000 and 15000, then on track 101° to cross LOKBL between 11000 and 13000, then on track 100° to cross LIYAH between 9000 and 11000, then on track 100° to cross PRKER between 7000 and 9000, then on track 100° to cross MOWGN at 6000, then on track 090°. Expect RADAR vectors to final approach course.

PROTOTYPE-NOT FOR NAVIGATION



# Federal Aviation Administration

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## Memorandum

Date: Nov 14, 2023  
To: Tom Lattimer, Airspace Manager CSA PBN Team  
From: Jeffrey Chester, TCID Airspace and Procedures Manager  
Prepared by: Steven Pullen, Senior ATC Specialist, NAVTAC Support  
Subject: Letter of Approval Request MBELL STAR, KSDF

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KSDF MBELL Standard Terminal Arrival Route (STAR):

BLEEM to DOWNS Deceleration Distances.  
BLEEM to GLENM Deceleration Distances.  
LIYAH to PRKER Deceleration Distances.  
BLEEM to DOWNS Descent Gradient.

### **BLEEM to DOWNS Deceleration Distances**

Currently, FAAO 8260.3F, PARA 2-2-10 prescribes allowable deceleration distances for STAR development. The length of the leg from BLEEM to DOWNS is 4.14 NM. This leg must be at least 9.06 NM long due to deceleration from 280.0 KIAS to 250.0 KIAS required due to crossing below 10,000 feet MSL. Flight Standards approval is required.

The MBELL STAR serves Indianapolis International Airport. The altitude and speed restrictions on the MBELL STAR are designed to separate aircraft on the procedure from either adjacent airspace or other traffic. Additionally, the procedure does not have any reported issues by either air traffic control or the airline industry since implementation.

Industry flight data shows aircraft will begin the deceleration phase prior to BLEEM to cross DOWNS at 250 KIAS. The deceleration of aircraft is not dependent upon the distance between two waypoints, but rather the distance between two speed restrictions. Industry has verified the leg lengths designed for the MBELL STAR are sufficient to meet both the altitude and speed restrictions.

Therefore, ZID is requesting a Letter of Approval to utilize the leg length of 4.14NM at BLEEM to DOWNS segment as designed with altitudes, and speed restrictions for publication.

## **BLEEM to GLENM Deceleration Distances**

Currently, FAAO 8260.3F, PARA 2-2-10 prescribes allowable deceleration distances for STAR development. The length of the leg from BLEEM to GLENM is 7.16 NM. This leg must be at least 9.06 NM long due to deceleration from 280.0 KIAS to 250.0 KIAS required due to crossing below 10,000 feet MSL. Flight Standards approval is required.

The MBELL STAR serves Indianapolis International Airport. The altitude and speed restrictions on the MBELL STAR are designed to separate aircraft on the procedure from either adjacent airspace or other traffic. Additionally, the procedure does not have any reported issues by either air traffic control or the airline industry since implementation.

Industry flight data shows aircraft will begin the deceleration phase prior to BLEEM to cross GLENM at 250 KIAS. The deceleration of aircraft is not dependent upon the distance between two waypoints, but rather the distance between two speed restrictions. Industry has verified the leg lengths designed for the MBELL STAR are sufficient to meet both the altitude and speed restrictions.

Therefore, ZID is requesting a Letter of Approval to utilize the leg length of 7.16NM at BLEEM to GLENM segment as designed with altitudes, and speed restrictions for publication.

## **LIYAH to PRKER Deceleration Distances**

Currently, FAAO 8260.3F, PARA 2-2-10 prescribes allowable deceleration distances for STAR development. The length of the leg from LIYAH to PRKER is 7.00 NM. This leg must be at least 9.06 NM long due to deceleration from 280.0 KIAS to 250.0 KIAS required due to crossing below 10,000 feet MSL. Flight Standards approval is required.

The MBELL STAR serves Indianapolis International Airport. The altitude and speed restrictions on the MBELL STAR are designed to separate aircraft on the procedure from either adjacent airspace or other traffic. Additionally, the procedure does not have any reported issues by either air traffic control or the airline industry since implementation.

Industry flight data shows aircraft will begin the deceleration phase prior to LIYAH to cross PRKER at 250 KIAS. The deceleration of aircraft is not dependent upon the distance between two waypoints, but rather the distance between two speed restrictions. Industry has verified the leg lengths designed for the MBELL STAR are sufficient to meet both the altitude and speed restrictions.

Therefore, ZID is requesting a Letter of Approval to utilize the leg length of 7.00NM at LIYAH to PRKER segment as designed with altitudes, and speed restrictions for publication.

## **Descent Gradient**

## **BLEEM to DOWNS Descent Gradient**

Currently, FAAO 8260.3F, PARA 2-2-8a (1), The STAR's maximum permissible descent gradient is 318 ft/nm (approximately 3.00 degrees). BLEEM has a restriction of BLOCK ALTITUDE 9,000 MSL to 11,000 MSL, and DOWNS has a restriction of BLOCK ALTITUDE 7,000 MSL TO 9,000 MSL. The descent gradient (482.55 ft/nm) from BLEEM to DOWNS is greater than the maximum permissible gradient allowed. Flight Standards approval is required.

The MBELL STAR serves Indianapolis International Airport. The altitude restrictions on the MBELL STAR are designed to separate aircraft on the procedure from either adjacent airspace or other traffic. The deviation from Descent Gradient criteria does not introduce any new risk into the system. Additionally, the procedure does not have any reported issues by either air traffic control or the airline industry since implementation.

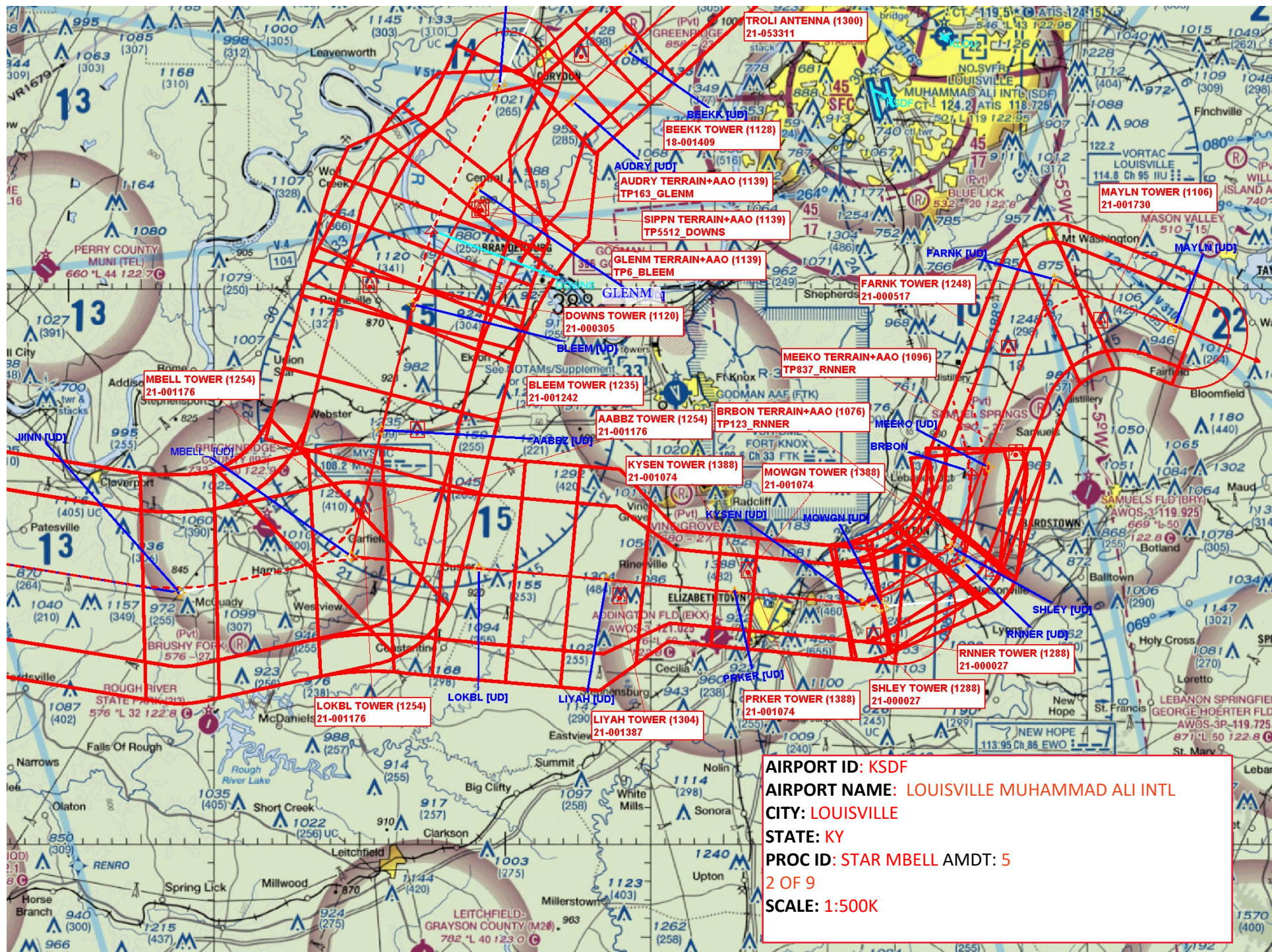
Therefore, ZID is requesting a Letter of Approval to utilize the altitudes at BLEEM (BLOCK ALTITUDE 9,000 MSL to 11,000 MSL) to DOWNS (BLOCK ALTITUDE 7,000 MSL to 9,000 MSL) as developed for the MBELL STAR.

Sincerely,

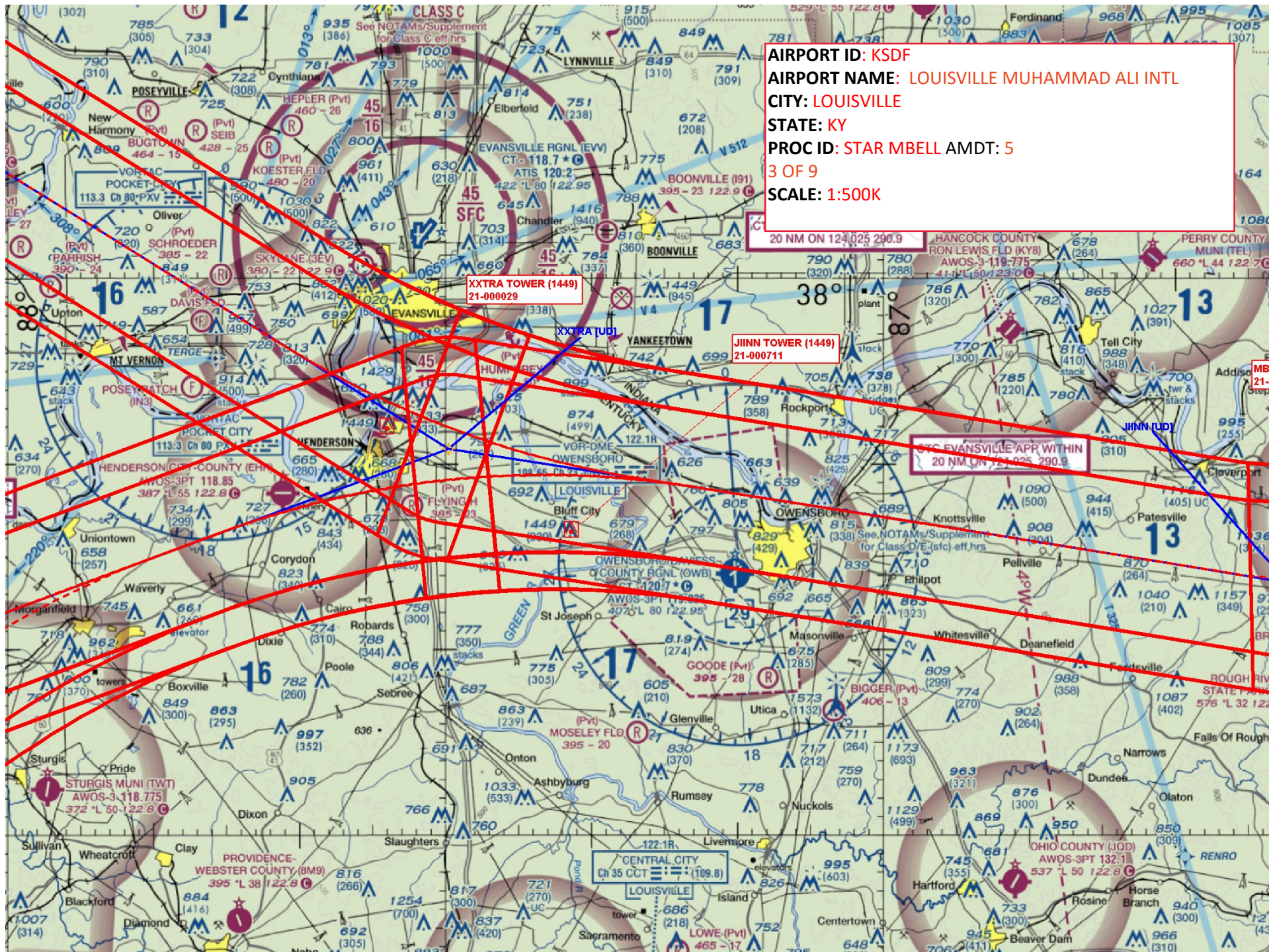
















AIRPORT ID: KDSF  
AIRPORT NAME: LOUISVILLE MUHAMMAD ALI INTL  
CITY: LOUISVILLE  
STATE: KY  
PROC ID: STAR MBELL AMDT: 5  
4 OF 9  
SCALE: 1:500K

VENMO TOWER (1030)  
17-000392

VENMO [UD]

CTC EVANSVILLE APP WITHIN  
20 NM ON 127.35 343.7

CTC EVANSVILLE APP WITHIN  
20 NM ON 127.35 343.7



**SCALE: 1:500K**

**VENMO TOWER (1030)**  
**17-000392**



AIRPORT ID: KSDF

AIRPORT NAME: LOUISVILLE MUHAMMAD ALI INTL

CITY: LOUISVILLE

STATE: KY

PROC ID: STAR MBELL AMDT: 5

6 OF 9

SCALE: 1:500K

CTC EVANSVILLE APP WITHIN  
20 NM ON 127.35 343.7

PENBE TOWER (1519)  
17-002415

PENBE TOWER (1325)  
21-001302



**AIRPORT ID: KSDF**

**AIRPORT NAME: LOUISVILLE MUHAMMAD ALI INTL**

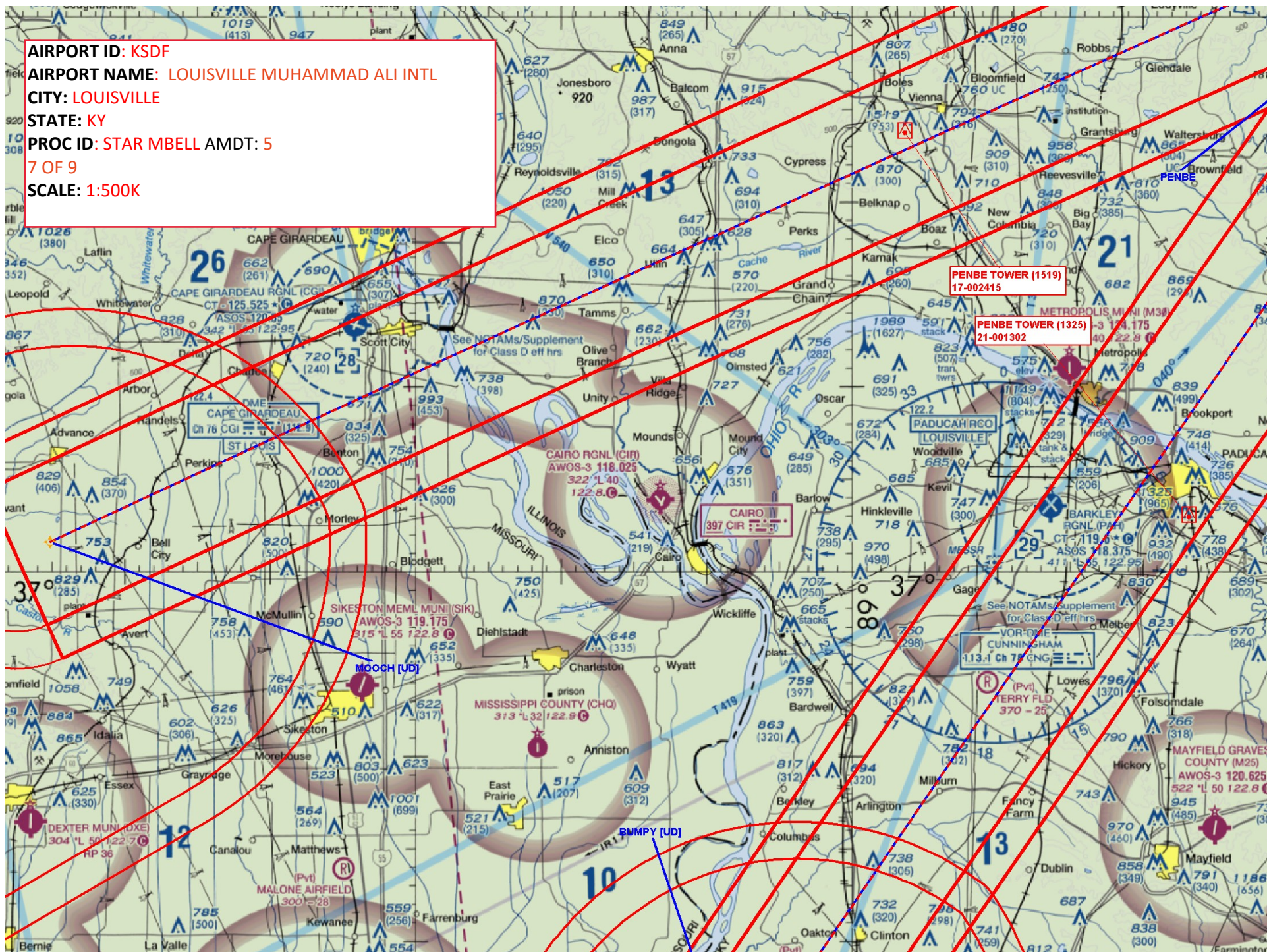
**CITY: LOUISVILLE**

**STATE: KY**

**PROC ID: STAR MBELL AMDT: 5**

**7 OF 9**

**SCALE: 1:500K**





AIRPORT ID: KSDF

AIRPORT NAME: LOUISVILLE MUHAMMAD ALI INTL

CITY: LOUISVILLE

STATE: KY

PROC ID: STAR MBELL AMDT: 5

8 OF 9

SCALE: 1:500K

