

**Docket No. SA-538**

**Exhibit No. 2-V**

**NATIONAL TRANSPORTATION SAFETY BOARD**

**Washington, D.C.**

Attachment 21 – BHM Chart Information  
(18 Pages)



## **NATIONAL TRANSPORTATION SAFETY BOARD**

Office of Aviation Safety  
Washington, D.C. 20594

February 1, 2014

### **Attachment 21 – BHM Chart Information**

# **OPERATIONAL FACTORS**

**DCA13MA133**

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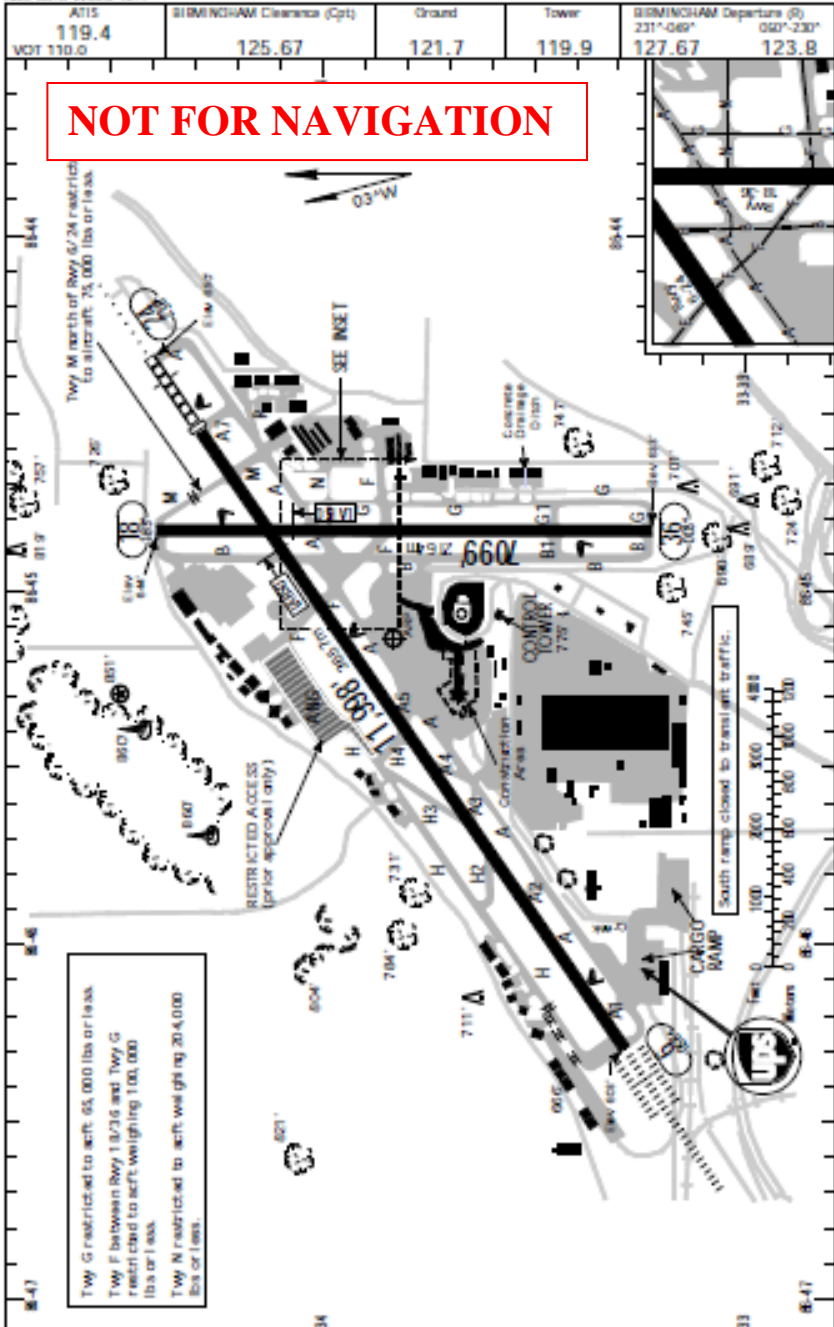
### A. BHM CHART INFORMATION

#### 1.0 UPS Jeppesen Charts<sup>1</sup>

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<sup>1</sup> UPS flight crews use Jeppesen charts. Charts provided to the NTSB by UPS.

**KBHM/BHM** (UPS Airlines) **JEPPESEN** **BIRMINGHAM, ALA**  
Apt Elev 650 12 APR 13 (10.9) -SHUTTLESWORTH INTL



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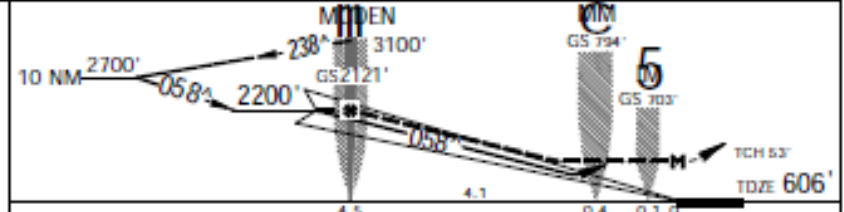
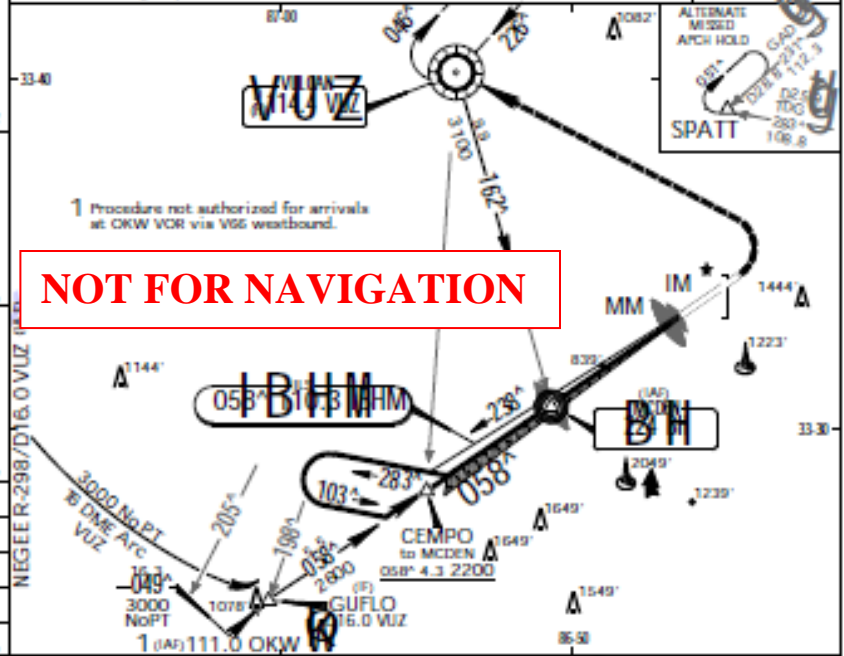
GENERAL						
Weather systems processor. Birds in vicinity of airport.						
<b>NOT FOR NAVIGATION</b>						
ADDITIONAL RUNWAY INFORMATION						
RWY		LANDING BEYOND Threshold	USABLE LENGTHS			WIDTH
			CLIDE Slope	LAHSO Distance	TAKE- OFF	
6	HIRL CL ALSF-II TDZ PAPI-L (angle 3.0°) grooved RVR		10,980' 3347m	18/36	8700' 2652m	150' 46m
24	HIRL CL MALSR PAPI-L (angle 3.0°) grooved RVR	10,801' 3292m	9566' 2916m			
18	MIRL REIL PAPI-L (angle 3.2°) grooved					150' 46m
36	MIRL REIL grooved			6/24	5150' 1570m	
TAKE-OFF & OBSTACLE DEPARTURE PROCEDURE						
Rwy 24						
2 operating RWYs are required All operating RWYs are controlling			With Min climb of 271' /NM to 1400'			
CL & HIRL		CL or RCLM & HIRL		Adequate Via Ref		STD
TDZ RVR MRE Rollout RVR		TDZ RVR MRE Rollout RVR		3 & 4 Eng		1 & 2 Eng
5 5 5 5		10 10 10 10		rvr 16 or 1/4		rvr 24 or 1/2 rvr 50 or 1
Rwy 6			Rwy 36			
With Min climb of 421' /NM to 1300'		With Min climb of 279' /NM to 1800'		With Min climb of 420' /NM to 1000'		Other
Adequate Via Ref		Adequate Via Ref		Adequate Via Ref		
STD		STD		STD		
3 & 4 Eng		1 & 2 Eng		3 & 4 Eng		1 & 2 Eng
rvr 16 or 1/4		rvr 24 or 1/2 rvr 50 or 1		300-1 3/4 1/4 1/2		1 300-2 1/4
Rwy 18						
With Min climb of 450' /NM to 1300'			With Min climb of 215' /NM to 1400'			
Adequate Via Ref		STD		Adequate Via Ref		
3 & 4 Eng		1 & 2 Eng		3 & 4 Eng		1 & 2 Eng
1/4		1/2		1		600-3
OBSTACLE DP						
Rwy 6, climb heading 058° to 1500' before proceeding on course. Rwy 18, climb heading 183° to 2300' before proceeding on course. Rwy 24, climb heading 238° to 2300' before proceeding on course. Rwy 36, climb heading 003° to 1400' before proceeding on course.						
FOR FILING AS ALTERNATE						
ILS Rwy 6 ILS Rwy 24		LOC Rwy 6 LOC Rwy 18 LOC DME Rwy 24 RNAV (GPS) Y Rwy 6 RNAV (GPS) Rwy 18 RNAV (GPS) Y Rwy 24		Authorized Only When Local Weather Available RNAV (RNP) Z Rwy 6 RNAV (RNP) Z Rwy 24		RNAV (GPS) Rwy 36
A						900-2
B	600-2		800-2	800-2		900-2 1/2
C						

Per 49 USC 831.6 - Confidential Commercial Information

**KBHM/BHM** **JEPPESEN** **BIRMINGHAM, ALA**  
 -SHUTTLESWORTH INTL 19 JUL 13 (1-1) **ILS or LOC Rwy 6**

ATIS 119.4	BIRMINGHAM Approach (R) 123.8	BIRMINGHAM Tower 119.9	Ground 121.7
LOC 119.4M <b>110.3</b>	Final Apch Crs <b>058°</b>	GS MCDEN 2121 (1515')	ILS DA(H) <b>806 (200')</b>
Apt Elev 650'			TDZE <b>606'</b>

**MISSED APCH:** Climb to 2000' then climbing LEFT turn to 3000' direct VUZ VOR and hold.  
 Alt Set: INCHES Trans level: FL 180 Trans alt: 18000'  
 1. VOSI and ILS glidepath not coincident.



Crld speed-Kts	70	90	100	120	140	160	2000	3000	VUZ 114.4
CS	3:00	3:22	4:08	5:31	6:37	8:49	↑	←	→
MCDEN to MAP 4.5	3:51	3:00	2:42	2:15	1:56	1:41			

STRAIGHT-IN LANDING RWY 6			LOC (GS out)	
ILS DA(H) 806' (200')			MDA(H) 1180' (574')	
HLL	102 or 11 out	ALS out	vs 24 or 1/2	vs 50 or 1
A			vs 50 or 1	1 1/2
B	vs 18 or 1/2	vs 24 or 1/2	vs 60 or 1 1/4	1 3/4
C		vs 40 or 3/4		
D				

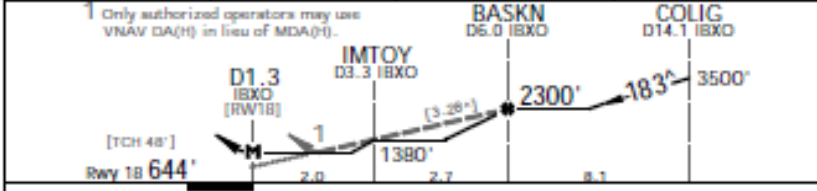
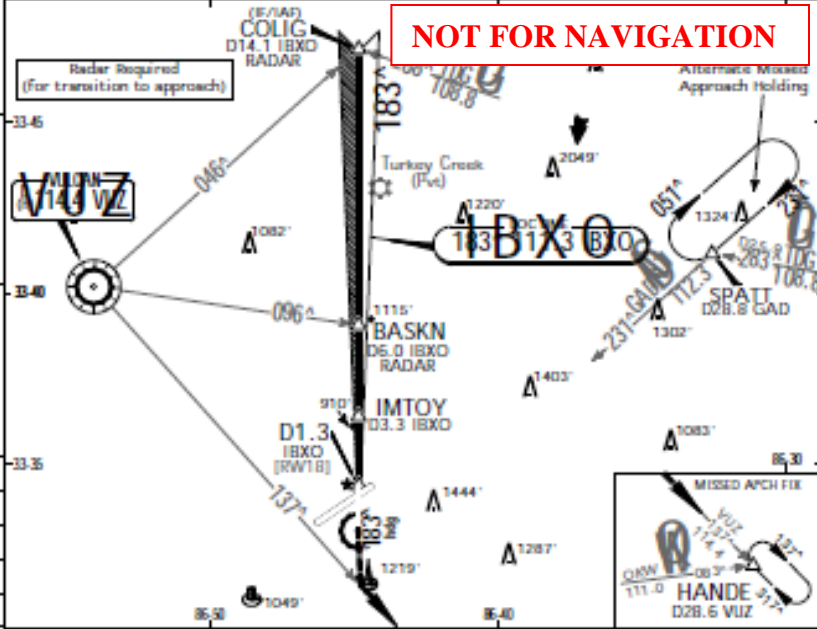
**KBHM/BHM** **JEPPESEN** **BIRMINGHAM, ALA**  
 -SHUTTLESWORTH INTL 17 AUG 12 (11-2) **LOC Rwy 18**

ATIS 119.4	BIRMINGHAM Approach (R) 123.8	BIRMINGHAM Tower 119.9	Ground 121.7
LOC IBXO 111.3	Final Aptch Crs 183 <sup>A</sup>	Minimum Alt BASKN 2300' (1656')	MDA(H) (CONDITIONAL) 1200' (556') Rwy 18 644'

**MISSED APCH:** Climb to 1500' on heading 183<sup>A</sup> then climbing LEFT turn to 3800' on VUZ VOR R-137 outbound to HANDE INT/D28.6 VUZ and hold, or as directed by ATC.

Alt. Sct: INCHES      Trans level: FL 180      Trans alt: 18000'

1. DME or Radar required. 2. When VOSI inop. procedure not authorized at night.  
 3. Localizer unusable beyond 15 degrees right of course. 4. Visibility reduction by helicopters not authorized.



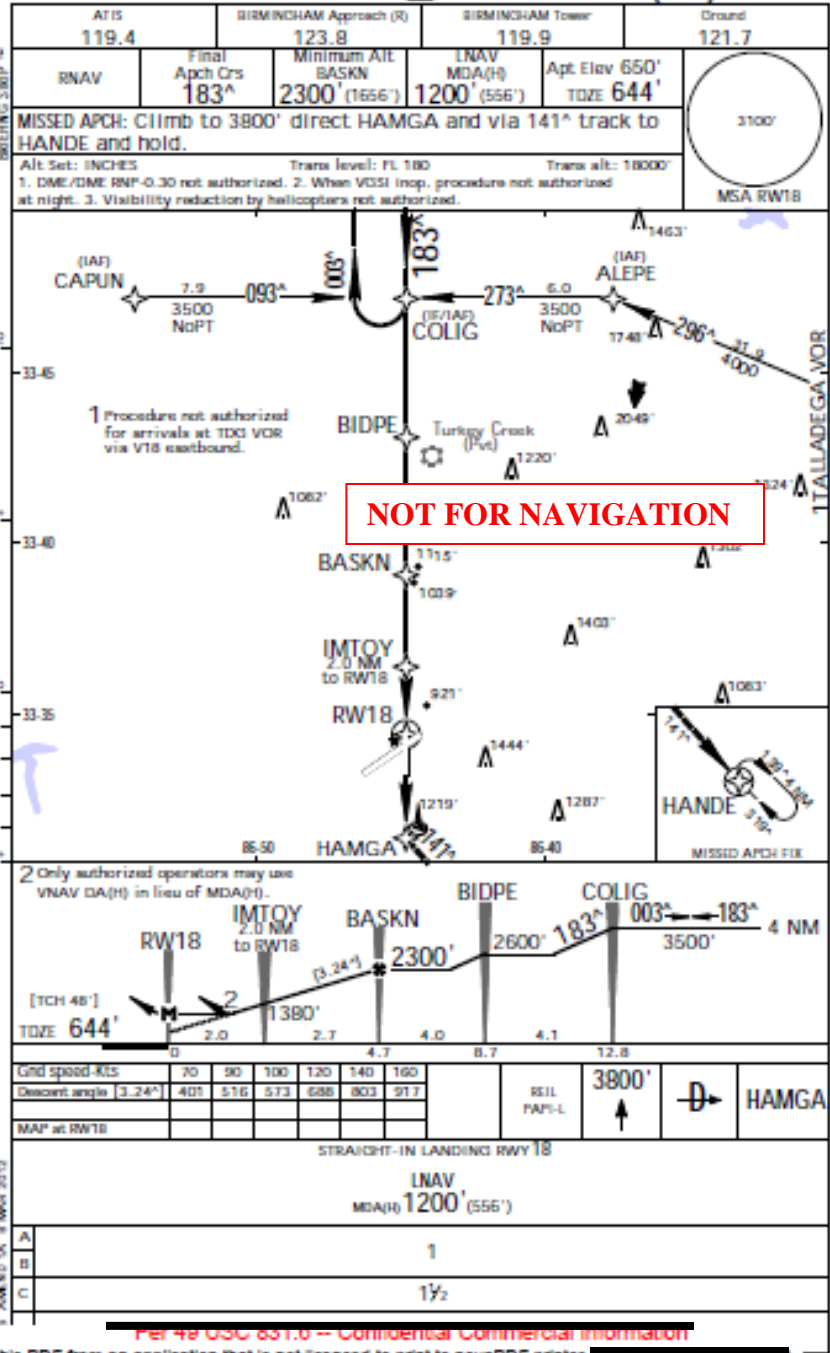
Grnd speed-Kts	70	90	100	120	140	160	REIL PAPI-L	1500'	183 <sup>A</sup> hdg	3800'	VUZ 114.4 R-137
Descent angle [3.28°]	4:06	5:22	5:50	5:56	6:13	6:29		↑	LT		
MAP at D1.3 IBXO or BASKN to MAP	4.7	4:02	3:08	2:49	2:21	2:07					

**TERPS..** STRAIGHT-IN LANDING RWY 18

A	MDA(H) 1200' (556') With IMTOY	DAY	MDA(H) 1380' (736') Without IMTOY	NIGHT
	1		1	
B				
C	1%		2	NA

Per 18 USC 894.5 - Confidential Commercial Information

**KBHM/BHM** **JEPPESEN** **BIRMINGHAM, ALA**  
 -SHUTTLESWORTH INTL 2 MAR 12 (12-2) **RNAV (GPS) RWY 18**



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UPS Airlines 21 DEC 12 10-10 BIRMINGHAM, ALA BIRMINGHAM INTL

KBHM / BHM A.R.P. N33 33.8 W086 45.2 Ramp N33 33.2 W086 46.1 Elev 644'

**RADIO FREQUENCIES**

FSS	123.6	122.2
ARRINC	130.20	
UPS	129.42	

**EMERGENCY AIRPORTS**

Not to scale

**SAFETY ALERT**

**Arrival**

- FOQA information indicates a high number of unstable approaches to this Airport.
- ATC may keep aircraft at high altitudes prior to approach.

**Departures**

- Pushback on Taxiway Alpha requires ATC clearance.

**ARRIVAL**

**A300** - The RNAV (GPS) 36 approach is N/A at night because of lights coming from buildings on final approach which may cause confusion when breaking out near minimums. Night visuals do not have this problem. It is recommended to load the RNAV (GPS) 36 approach into the FMC as a back up when flying a visual to runway 36.

**DEPARTURE**

During pushback tail will be turned towards the east.

**NOT FOR NAVIGATION**

**MISCELLANEOUS**

BHM FSS on field.

Airport surrounded by noise sensitive areas.

PLANNED: FedEx Airbus A320XLR - Confidential Commercial Information

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<b>ATLAS:</b> N/A		<b>TELEPHONE</b>	
FSS	Anniston FSS	800-992-7433	
Gateway Ops (AM/PM)	Manager	205-595-0410	
Gateway Ops (AM/PM)	Supervisor	205-595-0410	
Gateway Maintenance	UPS (Birmingham)	205-591-3417	
Gateway Fax	Birmingham	205-595-6147	
Flight Control	Louisville	502-359-0301	
AMC	Louisville	502-359-0001	
Flight Operations	Louisville	502-359-7917	
Flight Ops Fax	Louisville	502-359-7909	
Flight Manuals	Louisville	502-359-7939	
<b>TIME CONVERSION</b>		<b>GROUND SUPPORT EQUIPMENT</b>	
CST + 6 = UTC CDT + 5 = UTC		No Tailstands No 747 Stairs All other equipment available	
<b>SECURITY CODE</b>			
None			
<b>DE-ICING/ANTI-ICING PROCEDURES</b>			
<p><b>Available:</b> Type II fluids</p> <p>Accomplished by United upon request. Coordinate through UPS gateway operations. Plan to deice while blocked, with the engines shut down.</p>			
<b>NOT FOR NAVIGATION</b>			
<b>SAFETY INFORMATION</b>			
<p><b>EYEWASH STATION:</b> Located on the east wall of the warehouse, next to the lockers.</p> <p><b>ASSEMBLY AREA:</b> Assemble in the parking lot on west side of UPS office building.</p>			
<b>CLIMATOLOGY</b>			
<p>Pre-warm frontal fogs cause the most marginal weather. Thunderstorms, squall lines, and tornados are major features of the climate. Winter lows average in the lower 30's (F), and Summer highs average in the low 90's (F).</p>			

~~10-10 UPS 001.0 - Confidential Commercial Information~~

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**NOT FOR NAVIGATION**

TERMINAL CHART CHANGE NOTICES

No Chart Change Notices for Airport KBHM

~~Per 49 USC 804.6 - Confidential Commercial Information~~

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## 2.0 LOC18 Chart

### 2.1 Jeppesen chart at time of accident

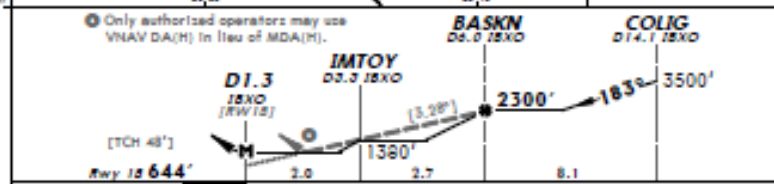
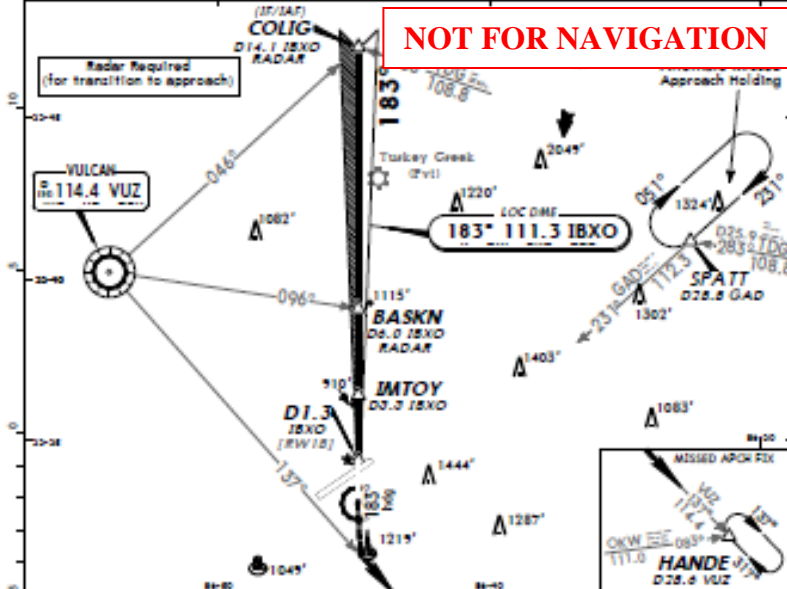
KBHM/BHM  
-SHUTTLESWORTH INTL

JEPPIEN  
17 AUG 12 (11-2)

BIRMINGHAM, ALA  
LOC Rwy 18

ATS 119.4	BIRMINGHAM Approach (R) 123.8	BIRMINGHAM Tower 119.9	Ground 121.7
LOC IBXO 111.3	Final Apch Crs 183°	Minimum Alt BASKN 2300' (1650')	MDA(H) (CONDITIONAL) 1200' (550')
MISSED APCH: Climb to 1500' on heading 183° then climbing LEFT turn to 3800' on VUZ VOR R-137 outbound to HANDE INT/D28.6 VUZ end hold, or as directed by ATC.			Apch Elev 650' Rwy 18 644'
Alt Set: INCHES 1. DME or Radar required. 2. When VGS1 Inop, procedure not authorized at night. 3. Localizer unusable beyond 15 degrees right of course. 4. Visibility reduction by helicopters not authorized.			Trans level: PL 100 Trans alt: 18000' MSA VUZ VOR 3700'

NOT FOR NAVIGATION

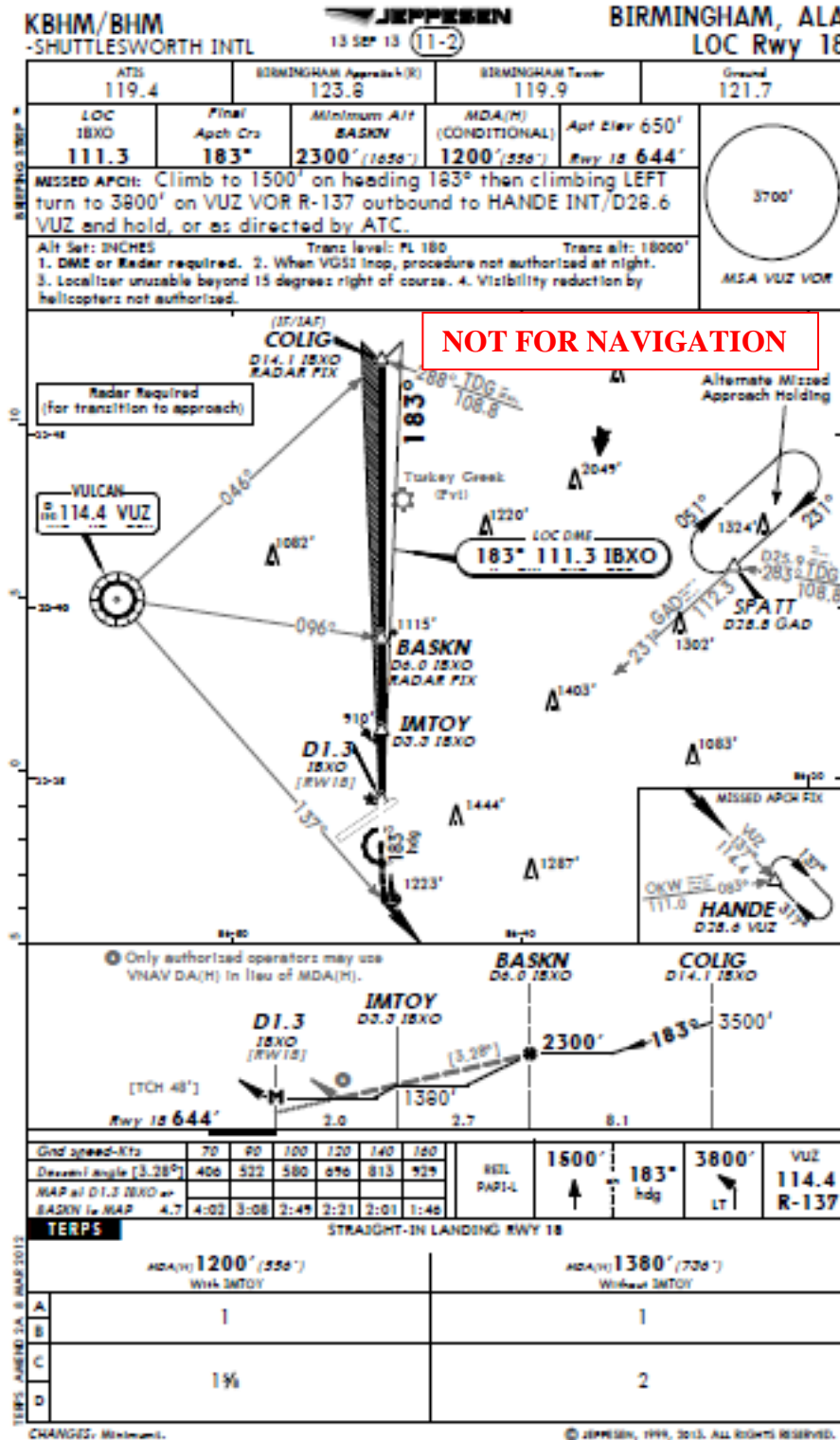


Wind speed-Kts	70	90	100	120	140	160	MSL 1600'	183° hdg	3800'	VUZ 114.4
Descent angle [3.28°]	406	522	580	676	813	925	PAPI-L	LT	R-137	
MAP at D1.3 IBXO ← BASKN is MAP	4:7	4:03	3:08	2:49	2:21	2:01				

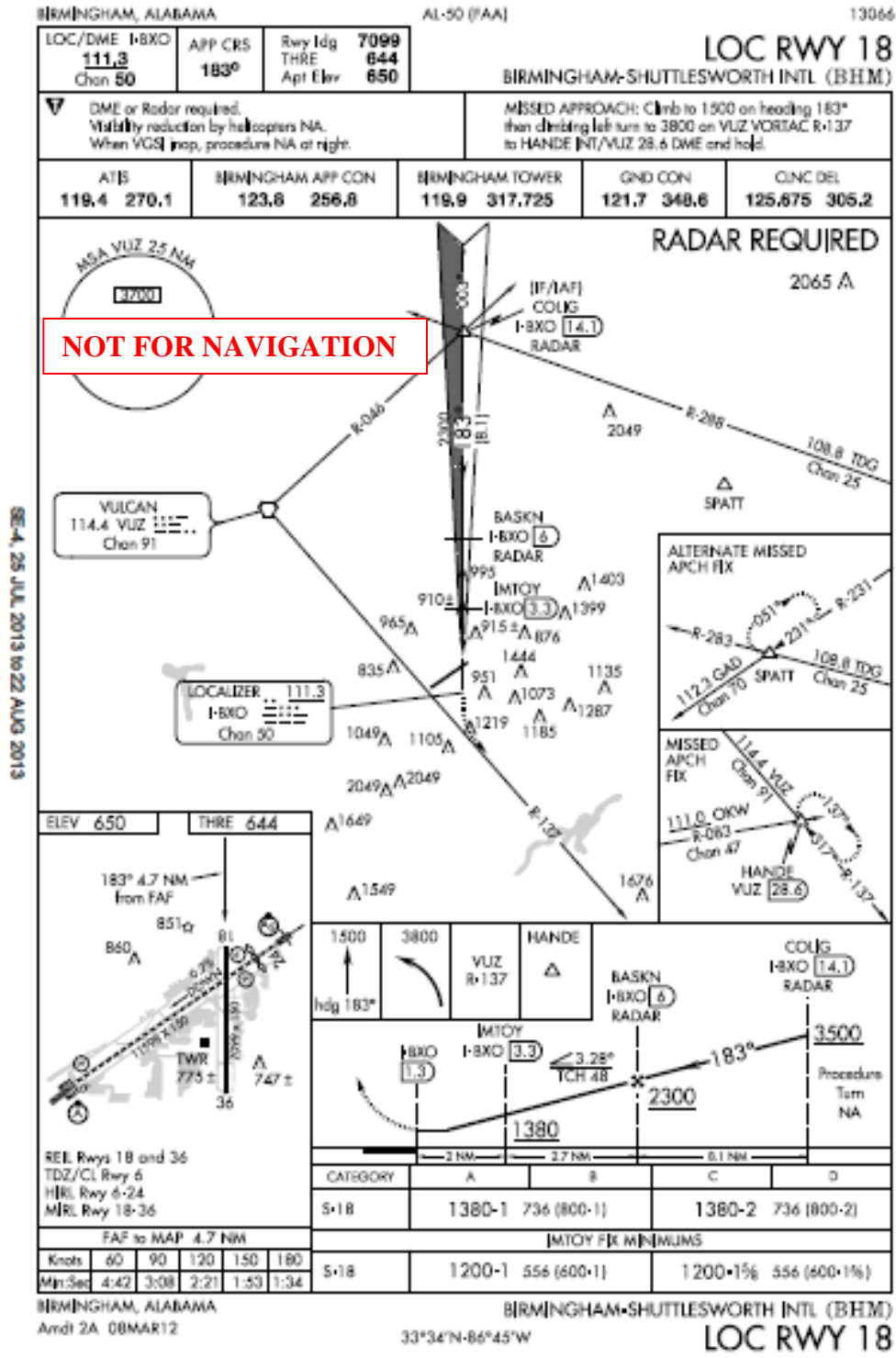
TERPS AMEND 3A, 6 MAR 2012	STRAIGHT-IN LANDING RWY 18		
	DAY	NIGHT	
	MDA(H) 1200' (550') With IMTOY	MDA(H) 1380' (720') Without IMTOY	
	A	1	1
B			
C	1%	2	NA
D			

CHANGES: None. © JEPPIEN, 1999, 2012. ALL RIGHTS RESERVED.



## 2.2 Jeppesen Chart Revised Post-accident



### 3.0 LOC18 Chart (FAA)



## 4.0 Runway 18 Overview

<b>KBHM/BHM</b> -SHUTTLESWORTH INTL		<b>JEPPESEN</b> 26 NOV 10 (19-05)	<b>AIRPORT FAMILIARIZATION</b> <b>BIRMINGHAM, ALA</b> <b>Rwy 18</b>
1. CAUTION: High Terrain in Northeast, Southeast and Southwest Quadrants 2. Primary Class C Airport 3. Land and Hold Short Operations 4. Noise Sensitive Areas		Apr Elev 650' 4 NM Northeast Birmingham NSG 33.8 W086.45.1	
<div style="border: 2px solid red; padding: 5px; display: inline-block; color: red; font-weight: bold;">NOT FOR NAVIGATION</div>			
			
<b>RUNWAY 18</b>			
<p>Visual vertical guidance is provided by PAPI (3.2°) on the left side of the runway.</p> <p>There is an Obstacle Departure Procedure for this runway and the lowest takeoff minimums require a minimum climb gradient of 340 feet/NM up to 1700 feet MSL.</p> <p>Engine inoperative rejected landings and missed approach procedures may require special attention due to high climb gradients necessary for obstacle clearance. Check to see if your company provides special procedures for this runway.</p>			
<small>CHANGES: Engine, Inop, rejected, landing, note.</small>		<small>© JEPPESEN, 1993, 2010, ALL RIGHTS RESERVED.</small>	



## 5.0 LOC18 Chart NOTAM<sup>2</sup>

U.S. DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION LOC STANDARD INSTRUMENT APPROACH PROCEDURE FLIGHT STANDARDS SERVICE - TITLE 14 CFR PART 97.25				Bearings, headings, courses, and radials are magnetic. Elevations and altitudes are in feet, MSL, except HAT, HAA, TCH, and RA. Altitudes are minimum altitudes unless otherwise indicated. Ceilings are in feet above airport elevation. Distances are in nautical miles unless otherwise indicated, except visibilities which are in statute miles or in feet RVR.											
TERMINAL ROUTES				MISSED APPROACH											
FROM	TO	COURSE AND DISTANCE	ALTITUDE												
COLIG INTA-BXO 14.07 DME/RADAR (IF/IAF)	BASKN/I-BXO 6.02 DME/RADAR	183.03 / 8.05 (I-BXO)	2300	MAP: 4.68 MILES AFTER BASKN/I-BXO 6.02 DME/RADAR OR AT I-BXO 1.34 DME FIX											
				CLIMB TO 1500 ON HEADING 183 THEN CLIMBING LEFT TURN TO 3800 ON VUZ VORTAC R-137 TO HANDE INT/VUZ 28.56 DME AND HOLD, OR AS DIRECTED BY ATC.											
				ALTERNATE MA: CLIMB TO 1800 THEN CLIMBING LEFT TURN TO 3800 ON HEADING 025 AND ON GAD VOR/DME R-231 TO SPATT INT AND HOLD.											
				ADDITIONAL FLIGHT DATA: HOLD SE, RT, 316.51 INBOUND. CHART IN PLANVIEW: ALTERNATE MA HOLDING, HOLD NE SPATT INT, RT, 231.00 INBOUND. CHART FAS OBS: 910 TREE 333612N0864451W 1115 AAO 333915N0864423W. CHART IN PLANVIEW: SPATT INT. BASKN TO RW18: 3.28/48											
1. PT NA SIDE OF COURSE OUTBOUND FT WITHIN MILES OF (IAF)				MAG VAR: 3W EPOCH YEAR: 2010											
2. PROFILE STARTS AT COLIG															
3. FAC 183.03 FAF BASKN/I-BXO 6.02 DME/RADAR DIST FAF TO MAP 4.68 THLD 4.68															
4. MIN. ALT COLIG 3500, BASKN 2300, IMTOY/I-BXO 3.34 DME 1380															
8. MSA FROM: VUZ VORTAC 3700															
MINIMUMS															
TAKEOFF: SEE FAA FORM 8260-15A FOR THIS AIRPORT								ALTERNATE: N A				STANDARD			
CATEGORY	A			B			C			D			E		
S-18	MDA	VIS	HAT/HAA	MDA	VIS	HAT/HAA	MDA	VIS	HAT/HAA	MDA	VIS	HAT/HAA	MDA	VIS	HAT/HAA
	1380	1	736	1380	1	736	1380	2	736	1380	2	736			
IMTOY FIX MINIMUMS															
S-18	1200	1	556	1200	1	556	1200	1 5/8	556	1200	1 5/8	556			
NOTES: CHART NOTE: DME OR RADAR REQUIRED. CHART NOTE: PROCEDURE NA AT NIGHT. <b>Supceded by Amendment 1A (Page 4)</b> CHART NOTE: VISIBILITY REDUCTION BY HELICOPTERS NA. CHART PLANVIEW NOTE: RADAR REQUIRED.															
CITY AND STATE BIRMINGHAM, AL		ELEVATION: 650 THRE: 644 AIRPORT NAME: BIRMINGHAM-SHUTTLESWORTH INTL		FACILITY IDENTIFIER: I-BXO		PROCEDURE NO./AMDT NO./EFFECTIVE DATE: LOC RWY 18, AMDT 2 15 DEC 2011				SUP AMDT <b>1</b> DATE 10/22/2009					

FAA FORM 8260-5 / April 2006 (computer generated)

PAGE 1 OF 3 PAGES

<sup>2</sup> Information provided to the NTSB by UPS.

**AIRAC Date: 08 MAR 2012**

FDC 1/3755 BHM FI/P IAP BIRMINGHAM-SHUTTLESWORTH INTL, BIRMINGHAM, AL. LOC RWY 18, AMDT 2... DELETE NOTE PROCEDURE NA AT NIGHT. CHART NOTE: WHEN VGSI INOP, PROCEDURE NA AT NIGHT. THIS IS LOC RWY 18, AMDT 2A.

FDC 1/3759 BHM FI/P IAP BIRMINGHAM-SHUTTLESWORTH INTL, BIRMINGHAM, AL. RNAV (GPS) RWY 18, AMDT 1... CHART NOTE: WHEN VGSI INOP, PROCEDURE NA AT NIGHT. THIS IS RNAV (GPS) RWY 18, AMDT 1A.

FDC 1/4927 MER FI/P IAP CASTLE, ATWATER, CA. RNAV (GPS) RWY 31, ORIG-B... PROCEDURE REVISION NUMBER CHANGE. THIS IS RNAV (GPS) RWY 31, ORIG-C.

FDC 1/4928 MER FI/P IAP CASTLE, ATWATER, CA. RNAV (GPS) RWY 13, ORIG-B... PROCEDURE REVISION NUMBER CHANGE. THIS IS RNAV (GPS) RWY 13, ORIG-C.

FDC 1/5302 LAS FI/P IAP MC CARRAN INTL, LAS VEGAS, NV. ILS OR LOC RWY 25L, AMDT 3B... S-ILS 25L DA 2338/HAT 269 ALL CATS, VISIBILITY ALL CATS 1. S-LOC 25L MDA 2740/ HAT 671 ALL CATS, VISIBILITY CATS C 2, D 2 1/4, E 2 1/2. SIDESTEP 25R MDA 2740/HAT 673 ALL CATS, VISIBILITY CATS C 1 1/2, D 1 3/4, E 2. CIRCLING MDA CATS A/B 3080/HAA 899. MDA CATS C/D 3280/HAA 1099, VISIBILITY CAT A 1 1/4, CATS C/D 3. CHANGE ALTERNATE MINIMUMS FOR CATS C/D TO 1100-3. CHART NOTE: FOR INOPERATIVE MALSR, INCREASE SIDESTEP 25R CAT E VISIBILITY 1/2 MILE. THIS IS ILS OR LOC RWY 25L, AMDT 3C.

FDC 2/1481 SYR FI/P IAP SYRACUSE HANCOCK INTL, SYRACUSE, NY. RNAV (GPS) RWY 15, AMDT 1... LNAV/VNAV DA 889/HAT 472, VIS 1 3/4 ALL CATS. CIRCLING CAT A/B VIS 1. CHART FAS OBST: 597 WATERTOWER 430833N/0760731W DELETE FAS OBST: 598 3 TWRS 430908N/0760759W CHART NOTE: VISIBILITY REDUCTION BY HELICOPTERS NA. CHANGE BARO-VNAV NOTE TO READ: FOR UNCOMPENSATED BARO-VNAV SYSTEMS, LNAV/VNAV NA BELOW -15C (5F) OR ABOVE 48C (118F). CHANGE INOPERATIVE TABLE NOTE TO READ: INOPERATIVE TABLE DOES NOT APPLY TO LNAV/VNAV ALL CATS AND LNAV CAT C. THIS IS RNAV (GPS) RWY 15, AMDT 1A.