

National Transportation Safety Board
Office of Aviation Safety
Washington, DC 20594



DCA24LA318

OPERATIONAL FACTORS

Group Chair's Factual Report
September 25, 2025

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A. INCIDENT

Location: Chicago, Illinois
Date: September 25, 2024
Time: 1526 central daylight time (CDT)¹
2026 universal time coordinated (UTC)
Airplane: Embraer 170-100, N772MR; Envoy 3936

B. OPERATIONAL FACTORS

Group Chair	Starr Blum National Transportation Safety Board Washington, D.C.
Subject Matter Expert	Dr. Katherine Wilson National Transportation Safety Board Washington D.C.
Group Member	Gerard Smithers Airline Pilots Association Dallas, TX
Group Member	Timothy Graham Envoy Air Inc. Chicago, IL
Group Member	Heidi Kemner Federal Aviation Administration - AVP-110 Washington D.C.

C. SUMMARY

On September 25, 2024, about 1526 central daylight time (CDT), Envoy Airlines flight 3936 (ENY3936), an Embraer 170-100 LR, N772MR, was cleared for the instrument landing system (ILS) approach to land on runway 10C at Chicago O'Hare International Airport (ORD), Chicago, Illinois, but the flight crew landed on runway 10L. None of the 68 occupants aboard the airplane were injured, and the airplane was not damaged. The regularly scheduled passenger flight was operated under the provisions of Title 14

¹ Times within this report will be in CDT and at the time of the incident UTC time was CDT+5 hours unless noted otherwise.

Code of Federal Regulation Part 121 from Norfolk International Airport (ORF), Norfolk, Virginia, to ORD.

D. FACTUAL INFORMATION

1.0 OPERATIONAL FACTORS GROUP ACTIVITIES

September 27, 2024 - The Operational Factors Group Chair were notified of the incident and began collecting data to begin travel and the investigation. Requests for pilot interviews, pilot records, flight information, and manuals were sent via email to the Envoy's party coordinator.

October 7, 2024 - The Ops Group Chairman and other group members traveled to Dallas, Texas, to conduct interviews with the incident crew the next day. The Subject Matter Expert (SME) was unable to travel, the FAA group member was unable to attend.

October 8, 2024 - The group convened at Envoy Air Inc. headquarters in Dallas, TX for interviews. Human Performance SME attended virtually. Pilot certifications records were requested from the FAA.

2.0 HISTORY OF FLIGHT

According to crew interviews and trip pairing documents, the incident flight was the first leg on the second day of the trip. The crew reported for duty at ORF for a scheduled 1435 flight. The captain was pilot monitoring (PM), and the first officer was the pilot flying (PF). The flight left early at 1427 EST² and landed in ORD at 1536. The crew stated they felt rested and the preflight was normal and not rushed. Prior to departure, the crew looked at the weather and flight plan into ORD and programmed the WATSN 4 RNAV Arrival³ landing runway 27R. Once they were enroute at cruise altitude they obtained the ORD ATIS⁴, and ORD had switched from landing to the west and were then landing to the east. The captain anticipated landing on runway 9L and proceeded to load the ILS⁵ 9L approach into the FMS.⁶ The crew stated every approach that was loaded into the FMS was fully briefed.

As the flight approached the top of descent, the new ATIS said runway 9C was in use. The captain proceeded to load the ILS 9C into the FMS. About 30 miles from the WATSN intersection, the air route traffic control center (ARTCC) assigned the ESSPO 5 RNAV Arrival⁷. The new ORD ATIS said to expect runway 10R. The captain

² Eastern Standard Time.

³ See section 6 of this report for the Jeppesen Chart of the arrival procedure.

⁴ Automatic Terminal Information Service

⁵ Instrument Landing System.

⁶ Flight Management System.

⁷ See section 6 of this report for the Jeppesen Chart of the arrival procedure.

then loaded the FMS and crosschecked the waypoints. Near the waypoint LAACY, ORD approach control instructed the crew to expect ILS 10C. On the approximate downwind leg, the captain then loaded the ILS10C for runway 10C. The captain stated that because they were below 10,000' msl⁸, he briefed the approach for the first officer.

The crew was given a 360° heading followed by 060° and was cleared to join the localizer for the ILS 10C. The correct localizer frequency was tuned in the Nav⁹ 1 radio for 4 seconds.¹⁰ According to the crew the localizer frequency for 10C did not auto-tune. The captain tried to manually load the frequency; the localizer and glideslope receivers were unable to sense the ILS. As the captain continued to try to troubleshoot the FMS, the first officer said he could see the runway and continued to runway 10C visually.

The crew did not communicate with ATC because they were having issues with tuning the localizer frequency. Prior to passing the final approach fix (FAF) the captain perceived they were slightly high. He then took control of the airplane momentarily to descend and then gave the first officer back control of the airplane. The captain stated he conducted a visual scan of the runways, used his iPad, and the primary flight display (PFD) as a means of verifying which runway they were lined up with and felt confident they were aligned with runway 10C. The first officer stated he believed they were lined up correctly on runway 10C.

The airplane touched down on runway 10L. The crew was unaware they were lined up with the wrong runway until they touched down. The air traffic tower controller reported a possible pilot deviation and issued a Brasher Warning.¹¹

3.0 CREW

The incident flight crew consisted of a captain and first officer. During the interview with the captain, he stated that he had flown into ORD and landed on runway 10C "only a handful of times" and prior to Envoy he had flown into ORD possibly once to the best of his recollection. The most recent was about two weeks prior to the incident. The first officer stated during his interview that it was his second time operating into ORD since his employment began with Envoy. Both crew members stated that this pairing was the first time they had flown with each other¹².

3.1 Captain

The captain was 54 years-old and held an Airline Transport Pilot (ATP) certificate with a rating for airplane multiengine land, commercial pilot privileges; single-engine land,

⁸ Mean Sea Level.

⁹ Navigation

¹⁰ Source: Flight Data Recorder Specialist Factual Report.

¹¹ Source: FAA - Air Traffic Procedures Bulletin Issue# 2021-1.

¹² Source: Operational Factors - Attachment 1 Crew Interviews and Written Statements.

and type ratings on the CL-65¹³, ERJ-170¹⁴, and ERJ-190 which included limitations of English Proficient; ATP Circling approach - Visual Meteorological Conditions (VMC) only; CL-65, ERJ-170, ERJ-190. He held an FAA first-class medical certificate dated August 19, 2024, with limitation must use corrective lens(es) to meet vision requirements at all distances. During his interview he reported wearing his corrective lenses during the incident.

3.1.1 Captain's Certification Records

FAA records of the captain indicated the following:

Private Pilot - Airplane Single-Engine Land certificate was issued August 9, 1994.

Notice of Disapproval - Airplane Multiengine Land certificate was issued May 2, 1995. Unsatisfactory items: Area of Operations XII Task H.

Private Pilot - Airplane Single and Multiengine Land certificate was issued May 4, 1995.

Notice of Disapproval - Airplane Single-Engine Land - Instrument certificate was issued May 11, 1999. Unsatisfactory items: Area of Operations VI.

Private Pilot - Airplane Single-Engine and Multiengine Land, Instrument Airplane; Airplane Multiengine Land Visual Flight Rules (VFR) only certificate was issued May 11, 1999.

Commercial Pilot - Airplane Single-Engine and Multiengine Land, Instrument Airplane certificate was issued January 14, 2005.

Commercial Pilot - Airplane Single-Engine and Multiengine Land, Instrument Airplane, CL-65; Limitations - CL-65 Second In Command (SIC) privileges only and circling approaches VMC only certificate was issued March 20, 2006.

Airline Transport Pilot - Airplane Multiengine Land, CL-65, Commercial Privileges Airplane Single Engine Land; Limitations - ATP and CL-65 circling approach VMC only certificate was issued June 1, 2008.

Airline Transport Pilot - Airplane Multiengine Land; CL-65, ERJ-170, ERJ-190; Commercial Pilot Privileges; Airplane Single Engine Land. Limitations - English

¹³ Bombardier Inc. CL-600-2B19, CL-600-2C10, CL-600-2D24, CL-600-2D15. Source: FAA Order 8900.1, Figure 5-88, dated March 29, 2024.

¹⁴ Embraer S.A., ERJ 170-100 STD, EFJ 170-100 LR, ERJ 170-100 SU, ERJ 170-100 SE, ERJ 170-200 STD, ERJ 170-200 LR, ERJ 170-200 SU, ERJ 190-100 STD, ERJ 190-100 LR, ERJ 190-100 IGW, ERJ 190-100 ECJ, ERJ 190-200 STD, ERJ 190-200 LR, ERJ 190-200 IGW, ERJ 190-300.

Proficient; ATP circling approach VMC only, CL-65, ERJ 170/190 circling approach VMC only certificate was issued May 24, 2022.

3.1.2 Captain's Flight Hours

The following flight times in hours were provided by Envoy Air Inc. including the incident flight:

Previous 24 hours	4.5
Last 30 days	30
Last 60 days	58
Last 90 days	112
Total Envoy ERJ 170/175	585
Total Time	7,112

3.1.3 Captain's Training

The following flight times in hours were provided by Envoy Air Inc. and the FAA:

ERJ-190/170 Type Ride	May 24, 2022
Envoy Air Date of Hire	April 13, 2023
Initial Operating Experience CA Line Check E-175	September 13, 2023
UNSATISFACTORY Maneuvers Validation ¹⁵	August 14, 2024
SATISFACTORY Maneuvers Validation	September 2, 2024
Most Recent Line Check	September 10, 2024
Most Recent CRM	August 13, 2024

3.2 First Officer

The first officer was 46 years-old and held an Airline Transport Pilot certificate with a rating for airplane multiengine land, commercial pilot privileges; single-engine land, and type ratings on the ERJ-170, and ERJ-190 which included limitations of English Proficient; ATP Circling approach - VMC only; ERJ-170, ERJ-190. A flight instructor

¹⁵ Envoy was unable to provide the reason the Maneuver Validations was unsatisfactory. Instructor comments were not retained.

certificate with airplane single engine; instrument airplane rating, He held an FAA first-class medical certificate dated July 29, 2024, with no limitations.

3.3 First Officer's Certification Records

FAA records of the pilot indicated the following:

Private Pilot - Airplane Single-Engine Land; Limitations English Proficient certificate was issued May 27, 2020.

Private Pilot - Airplane Single-Engine Land - Instrument Airplane; Limitations - English Proficient certificate was issued September 10, 2021.

Commercial Pilot - Instrument Airplane; Single-Engine Land; Limitations - English Proficient certificate was issued February 15, 2022.

Commercial Pilot - Airplane Single-Engine Land; Airplane Multiengine Land; Instrument Airplane; Limitations - English Proficient certificate was issued March 28, 2022.

Flight Instructor - Airplane Single-Engine certificate was issued August 29, 2022.

Flight Instructor - Airplane Single-Engine; Instrument Airplane certificate was issued February 14, 2023.

Airline Transport Pilot - Airplane Multiengine Land; ERJ-170/190; Commercial Pilot privileges; Airplane Single-Engine Land - Limitations - English Proficient; ATP circling approach VMC only, ERJ-170/190 circling approach VMC only certificate was issued July 8, 2024.

3.3.1 First Officer's Flight Hours

The following flight times were provided by Envoy Air Inc. including the incident flight:

Previous 24 hours	4.5
Last 30 days	30
Last 60 days	41
Last 90 days	71
Total Envoy ERJ 170/175	76
Total Time	1,619

3.3.2 First Officer's Training Record

The following records were provided by Envoy Air Inc. and FAA:

Envoy Air Date of Hire	April 11, 2024
ERJ-190/170 Type Ride	July 8, 2024
Initial Operating Experience FO Line Check E-175	July 26, 2024
Most recent CRM	May 8, 2024

4.0 TRAINING POSTINCIDENT

As a result of the wrong runway landing, Envoy incorporated visual approach flight training as of September 30, 2024. The new curriculum included initial, upgrade, and continuing qualification (ILP) instructor lesson plans¹⁶ to teach or review with the pilots.

5.0 AIRPLANE



Figure 1. Incident Airplane (Source: planespotter.com)

The airplane was an ERJ 170-100LR, Serial No 17000092 and was manufactured in 2004. The standard airworthiness certificate in the transport category was issued on

¹⁶ See Attachment 6 - Visual Approach Training (postincident).

July 27, 2023. It was powered by two General Electric CF34-8E engines, each capable of producing 14,500 pounds of thrust. The aircraft was purchased by and registered to American Airlines on April 11, 2022.

6.0 AIR TRAFFIC CONTROL

The airport configuration was utilizing runways 9L, 10C, and 10R for arriving aircraft and runways 10L and 9R for departing aircraft. This configuration had been the same for 2 hours and 16 minutes prior to Envoy 3936 landing. The flight established initial communication with the Chicago Terminal Approach Control and was told to expect runway 10C for landing. The controller cleared the flight for the ILS 10C.¹⁷

According to certified audio provided from the FAA, between 1450 to 1537, the final controller issued 16 ILS 10C approach clearances including the incident flight. None of the other flights reported anomalies or concerns with the ILS.

When the flight contacted the Airport Traffic Control Tower (ATCT), they were cleared to land on runway 10C. The crew acknowledged and read back the landing clearance. According to radar data, approximately 16 miles from the runway the flight joined the final for runway 10L with a slight overshoot. Figures 2 and 3 show the aircraft's flight path.

According to the FAA mandatory occurrence report (MOR) filed by ORD ATC, the controller observed the flight was lined up for runway 10L when the airplane was on short final. The controller then verbally coordinated with the controller responsible for runway 10L prior to Envoy 3936 landing. No overflight was observed, there was no traffic on or crossing 10L, and there was no loss of standard separation. The Air Traffic Manager reported that at the time of the incident, the traffic volume was *"light with routine complexity."*¹⁸

6.1 Notice to Airmen (NOTAMs)

The captain said they did review the NOTAMs and did not see any that were pertinent to their flight.¹⁹ A review of the NOTAMs revealed there were no NOTAMs affecting the ILS 10C.

¹⁷ See ATC Service Review in the public docket.

¹⁸ See ATC Service Review in the public docket.

¹⁹ See Attachment 1 - Crew Interviews and Written Statements.

6.1.1 Canceled NOTAMs

The following NOTAM was issued for the 10C glidepath unusable from June 4, 2024, through October 31, 2024; however, it was canceled on September 18, 2024, seven days prior to the wrong surface landing.

Issue	Date	UTC:	06/04/2024	0504
Start	Date	UTC:	06/04/2024	0504
Cancel	Date	UTC:	09/18/2024	0502
End	Date	UTC:	10/31/2024	2359

!ORD 06/107 ORD NAV ILS RWY 10C GP U/S 2406040504-2410312359

6.2 FAA Guidance

FAA Job Order (JO)7110.65AA, "Air Traffic Organization Policy," dated April 20, 2023, prescribed air traffic control procedures and phraseology for use by air traffic control personnel. It further required controllers to be familiar with the provisions within the order that pertain to their operational responsibilities and *"to exercise their best judgment if they encounter situations not covered by it."*

Additionally, JO 7110.65AA defined the role of ATC services, in part, as *"The primary purpose of the ATC system is to prevent a collision involving aircraft operating in the system. In addition to its primary purpose, the ATC system also: Provides a safe, orderly, and expeditious flow of air traffic"*²⁰

The JO 7110.65AA further provided, in part, the following guidance regarding *"Duty Priority"*²¹:

Give first priority to separating aircraft and issuing safety alerts as required in this order. Good judgment must be used in prioritizing all other provisions of this order based on the requirements of the situation at hand.

NOTE– Because there are many variables involved, it is virtually impossible to develop a standard list of duty priorities that would apply uniformly to every conceivable situation. Each set of circumstances must be evaluated on its own merit, and when more than one action is required, controllers must exercise their best judgment based on the facts and circumstances known to them. That action which is most critical from a safety standpoint is performed first...

²⁰ Source: FAA JO 7110.65AA, Section 2-1-1. "ATC Service." [7110.65AA Chg 3](#)

²¹ Source: FAA JO 7110.65AA, Section "2-1-2a. Duty Priority" [7110.65AA Chg 3](#)

6.3 Landing Clearance

The JO 7110 further provided, in part the following for “*landing clearance*”:²²

3-10-5. LANDING CLEARANCE

b. When you become aware that an aircraft is aligned with the wrong surface, inform the pilot and:

- 1. Issue control instructions/clearances, or*
- 2. If time permits, verify the pilot is aligned with the correct runway. Issue control instructions/clearances as necessary.*

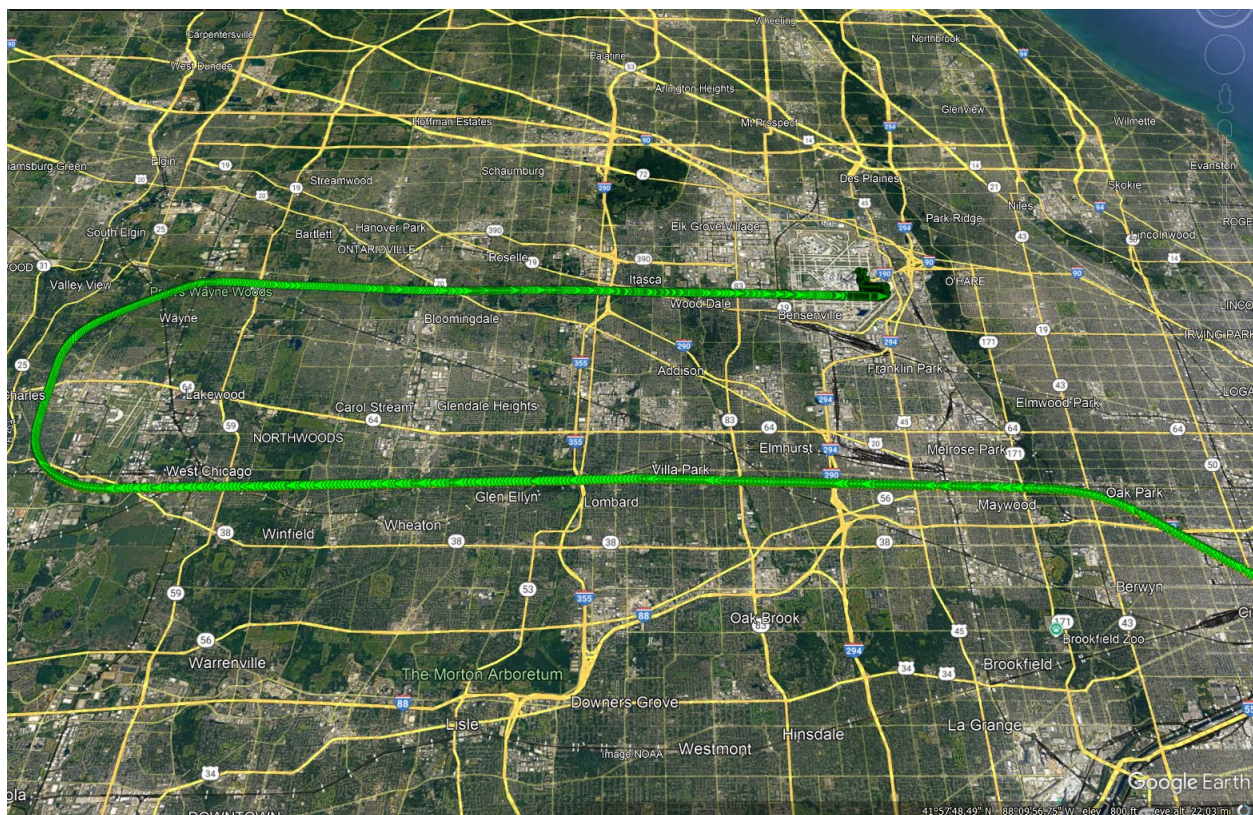


Figure 2. ADS-B of airplane arrival (Source: FAA)

²² Source: FAA JO 7110.65AA, Section “3-10-5b. Landing Clearance.” [7110.65AA Chg 3](#)

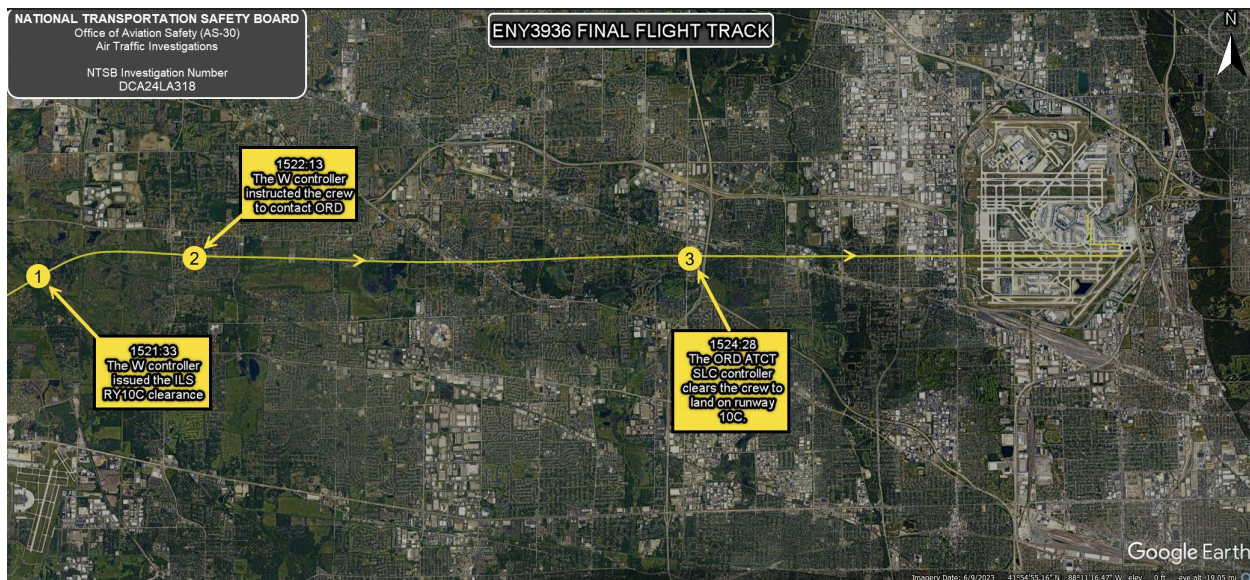


Figure 3. Final Flight Track (Source: FAA)

7.0 AIRPORT INFORMATION

Chicago O'Hare International Airport (ORD) is the largest of the three airports in the Chicago metropolitan area, located 17 miles northwest of the downtown financial district. Located at latitude/longitude N41°58.6' W087°54.5' and a field elevation of 680 ft msl. The airport serves as a main hub for United and American Airlines. ORD was owned and operated by the City of Chicago and was serviced by a FAA Air Traffic Control Tower that was in operation 24 hours a day. Approach radar services were provided by Chicago Approach Control located about 25 miles southwest of ORD.²³

At the time of the incident, ORD had 8 paved landing surfaces designated as runways 4R/22L, 4L/22R, 9R/27L, 9C/27C, 9L/27R, 10L/28R, 10C/28C, and 10R/28L. Runway 10C/28C had 9,756 ft landing distance available and was 200 ft wide. Runway 10C was serviced by a 4 light precision approach path indicator (PAPI) on the left and centerline lights. Runway 10L/28R had 11,133 ft landing distance available and was 150 ft wide. Runway 10L was serviced by a 4 light PAPI on the left side and centerline lights. Figure 4 is an ORD airport diagram and figure 5 provides runway information.

²³ Source: [Chicago O'Hare International Airport \(ORD\) | Official Website](https://www.faa.gov/airports/airports/ORD/)

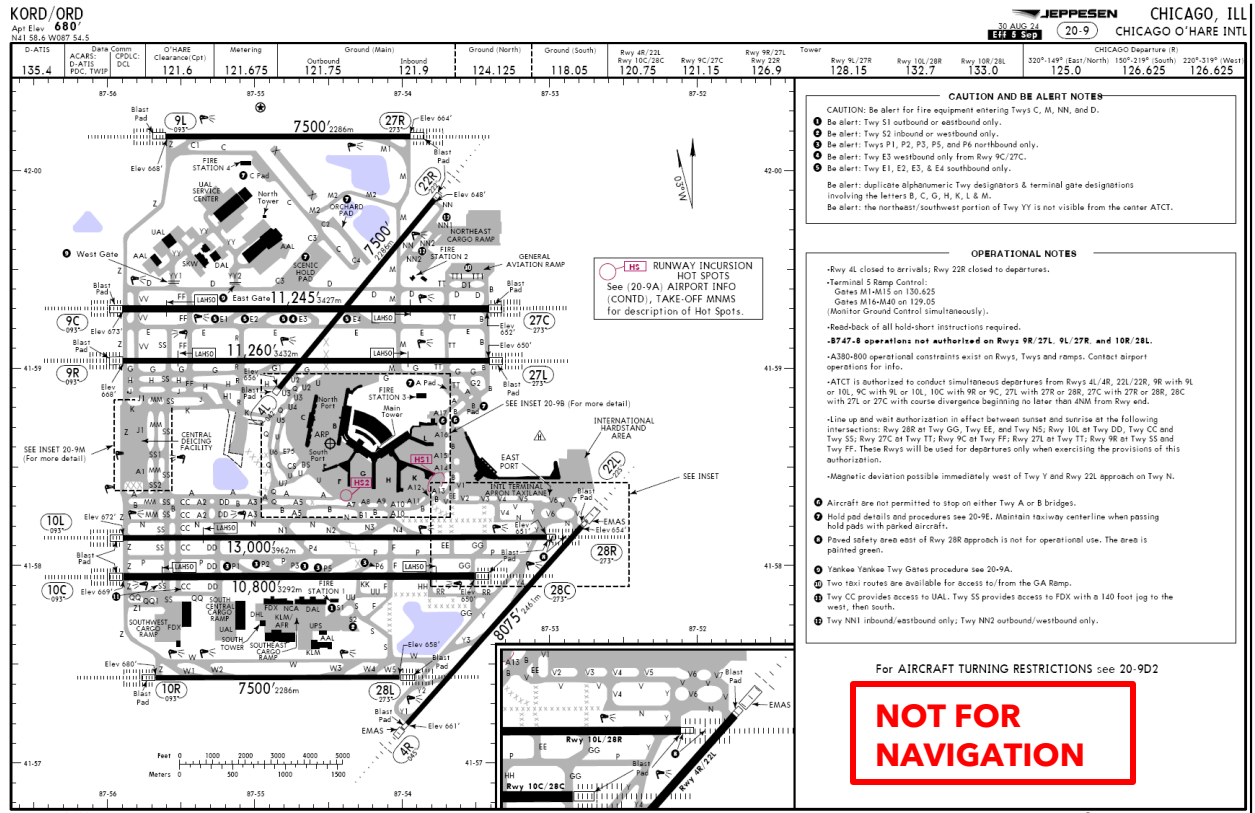


Figure 4. ORD 20-9 Airport Diagram (Source: Jeppesen)

KORD/ORD

JEPPESSEN
30 AUG 24
Eff 3 Sep (20-9A)

CHICAGO, ILL
CHICAGO O'HARE INTL

GENERAL						
ASDE-X in use. Operate transponders with altitude reporting mode and ADS-B (if equipped) enabled on all airport surfaces. Runway status lights are in operation. Birds on and in vicinity of apr, pyrotechnics and bird cannons in use for bird control. Noise abatement procedures in effect from 2200LT to 0700LT; contact airport manager. Low-level wind shear alert system. Terminal Doppler Weather Radar. Acft with wingspan greater than 214' (65m) require 48 hours prior permission. Diversion air carriers without a presence at O'Hare Intl should contact airport operations prior to diverting to the extent practical and provide: company, flight ops contact info, acft type, persons on board, international or domestic, any ground handler agreements in place.						
ADDITIONAL RUNWAY INFORMATION						
RWY			LANDING BEYOND Threshold	USABLE LENGTHS Glide Slope	LAHSO Distance	TAKE-OFF Width
4R	HIRL CL MALSR TDZ	● PAPI-R	grooved RVR	7026' 2145m		150' 46m
22L	HIRL CL MALSR TDZ	● PAPI-L	grooved RVR	6970' 2124m		150' 46m
4L	HIRL CL		grooved RVR			150' 46m
22R	HIRL CL MALSR TDZ	● PAPI-L	grooved RVR	6558' 1999m		NA
9R	HIRL CL ALSF-II TDZ	● PAPI-L	grooved RVR	10,107' 3081m	Twy TT 8780' 2676m	150' 46m
27L	HIRL CL ALSF-II TDZ	● PAPI-R	grooved RVR	10,194' 3107m	Twy VV 9620' 2932m	150' 46m
9C	HIRL CL ALSF-II TDZ	● PAPI-L	grooved RVR	10,131' 3088m	Twy TT 8850' 2691m	200' 61m
27C	HIRL CL ALSF-II TDZ	● PAPI-L	grooved RVR	10,175' 3101m	Twy VV 9725' 2964m	200' 61m
9L	HIRL CL ALSF-II TDZ		grooved RVR	6340' 1932m		150' 46m
27R	HIRL CL ALSF-II TDZ		grooved RVR	6364' 1940m		150' 46m
10L	HIRL CL ALSF-II TDZ	● PAPI-L	grooved RVR	11,133' 3393m		150' 46m
28R	HIRL CL ALSF-II TDZ	● PAPI-L	grooved RVR	11,970' 3648m	Twy SS 10,530' 3210m	150' 46m
10C	HIRL CL ALSF-II TDZ	● PAPI-L	grooved RVR	9449' 2880m	Twy GG 9610' 2929m	200' 61m
28C	HIRL CL ALSF-II TDZ	● PAPI-L	grooved RVR	9756' 2974m	Twy Z 9610' 2929m	200' 61m
10R	HIRL CL ALSF-II TDZ		grooved RVR	6388' 1947m		150' 46m
28L	HIRL CL ALSF-II TDZ		grooved RVR	6506' 1983m		150' 46m
● Angle 3.00°. ● LDA 7300' 2225m. ● Unusable beyond 8° right and 9° left of centerline. ● LDA 12,246' 3733m. ● LDA 10,540' 3213m.						
RUNWAY INCURSION HOT SPOTS						
(For information only, not to be construed as ATC instructions.)						
HS1 Aircraft/vehicles taxiing on Twy A between Twys A14 and A12, use caution for aircraft pushing onto Twy A from Gates K18 and K20. HS2 Aircraft/vehicles taxiing on Twy A near Twy A7, use caution for aircraft pushing onto Twy A from Gates F20 and F28.						
YANKEE YANKEE TAXIWAY GATES PROCEDURES						
NOTE - Twy YY is a movement area. Pilots/mechanics must call Ground Control on 124.12 for clearance to proceed.						
1. Communication between pilot/mechanic and special police in guard booth will be through Unicom bend (122.9). Calls are to be made in advance of leaving the hangar area outbound and after crossing north of Rwy 9C/27C when inbound to hangar area. 2. Aircraft will stop at surface painted hold bars until light changes from red to green signifying gate is completely open and safe for aircraft to taxi past the gate. 3. The East Gate will be manned 24 hours a day and the West Gate will be manned 24 hours a day.						
TERMS						
TAKE-OFF						
Rwys 4R, 9L/C/R, 10L/C/R, 22L, 27L, 28C/R						
LOWER THAN STANDARD Opspec Authorization Required						
2 operating RVRs are required. All operating RVRs are controlling.				STANDARD		
CL & HIRL	RCLM & HIRL	RCLM (day only) or CL or HIRL	RCLM or CL or HIRL or Adequate Vis Ref	3 & 4 Eng	1 & 2 Eng	
TDZ RVR 5	TDZ RVR 10	TDZ RVR 12	TDZ RVR 16	RVR 24	RVR 50	
Mid RVR 5	Mid RVR 10	Mid RVR 12	Mid RVR 16	or 1/2	or 1	
Rollout RVR 5	Rollout RVR 10	Rollout RVR 10	Rollout RVR 10			
1 Rwy 27L: With Min climb of 220'/NM to 1800'.						
Rwy 4L						
LOWER THAN STANDARD Opspec Authorization Required						
Both RVRs are required & controlling.				STANDARD		
CL & HIRL	CL or RCLM & HIRL	RCLM (day only) or CL or HIRL	RCLM or CL or HIRL or Adequate Vis Ref	3 & 4 Eng	1 & 2 Eng	
TDZ RVR 5	TDZ RVR 10	TDZ RVR 12	TDZ RVR 16	RVR 24	RVR 50	
Rollout RVR 5	Rollout RVR 10	Rollout RVR 10	Rollout RVR 10	or 1/2	or 1	
Rwy 27R, 27C, 28L						
LOWER THAN STANDARD Opspec Authorization Required						
2 operating RVRs are required. All operating RVRs are controlling.				STANDARD		
CL & HIRL	CL or RCLM & HIRL	RCLM (day only) or CL or HIRL	RCLM or CL or HIRL or Adequate Vis Ref	3 & 4 Eng	1 & 2 Eng	
TDZ RVR 5	TDZ RVR 10	TDZ RVR 12	TDZ RVR 16	RVR 24	RVR 50	
Mid RVR 5	Mid RVR 10	Mid RVR 12	Mid RVR 16	or 1/2	or 1	
Rollout RVR 5	Rollout RVR 10	Rollout RVR 10	Rollout RVR 10			
1 Rwy 27R: With Min climb of 220'/NM to 1700'.						
1 Rwy 27C: With Min climb of 220'/NM to 1800'.						
1 Rwy 28L: With Min climb of 210'/NM to 900', or alternatively, with standard takeoff minimums and a normal 200'/NM climb gradient, takeoff must occur no later than 1500' prior to DER.						
Rwy 22R						
NOT FOR NAVIGATION						
(For TAKE-OFF OBSTACLE NOTES SEE 20-9A1)						
FOR FILING AS ALTERNATE						
ILS Rwy 4R	LOC Rwy 9L/C/R	RNAV (GPS) PRM Y Rwy 10R				
ILS Rwy 9L/C/R	LOC Rwy 10L/C	RNAV (GPS) Z Rwy 10R				
ILS Y Rwy 10R	LOC Y Rwy 10R	RNAV (GPS) Rwy 27C/R				
ILS Z Rwy 10R	LOC Z Rwy 10R	RNAV (GPS) Rwy 28C/R				
ILS PRM Rwy 10C	LOC Rwy 27L/C/R	RNAV (GPS) PRM Rwy 28C				
ILS PRM Y Rwy 10R	LOC Rwy 28L/C/R	RNAV (GPS) Z Rwy 27L				
ILS Rwy 22L	RNAV (GPS) Rwy 9L/C/R	RNAV (GPS) Z Rwy 28L				
ILS Rwy 22R	RNAV (GPS) Rwy 10L/C	RNAV (GPS) PRM Y Rwy 28L				
ILS Rwy 27L/C/R	RNAV (GPS) PRM Rwy 10C	RNAV (GPS) PRM Y Rwy 27L				
ILS Rwy 28L/C/R	RNAV (GPS) Y Rwy 10R					
ILS PRM Rwy 28C						
A	600-2	800-2				
B						
C						
D						
				800-2		
				800-2 1/2		

CHANGES: Hotspot descriptions, chart format.

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Figure 5. ORD 20-9A Airport Runway Information (Source: Jeppesen)

7.1 WATSN 4 RNAV ARRIVAL

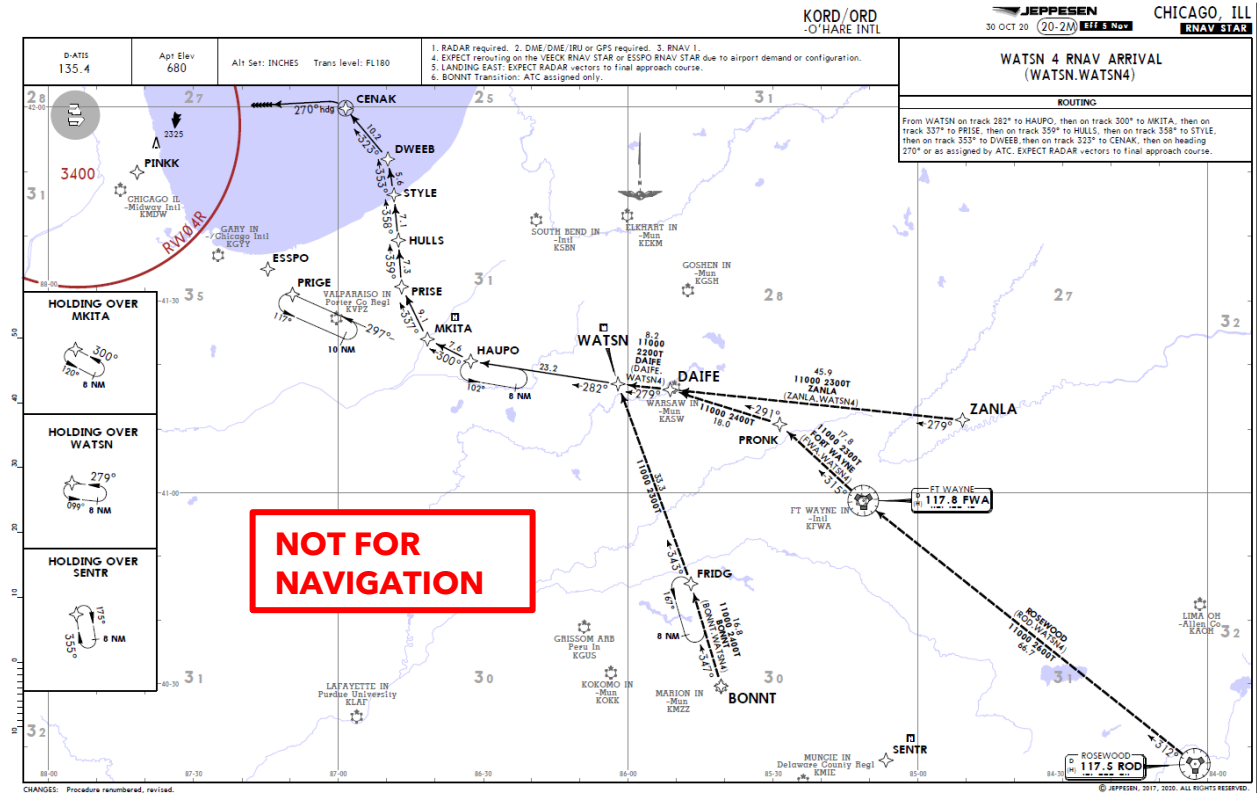


Figure 6. WATSN 4 RNAV ARRIVAL (Source: Jeppesen)

7.2 ESSPO 5 RNAV Arrival

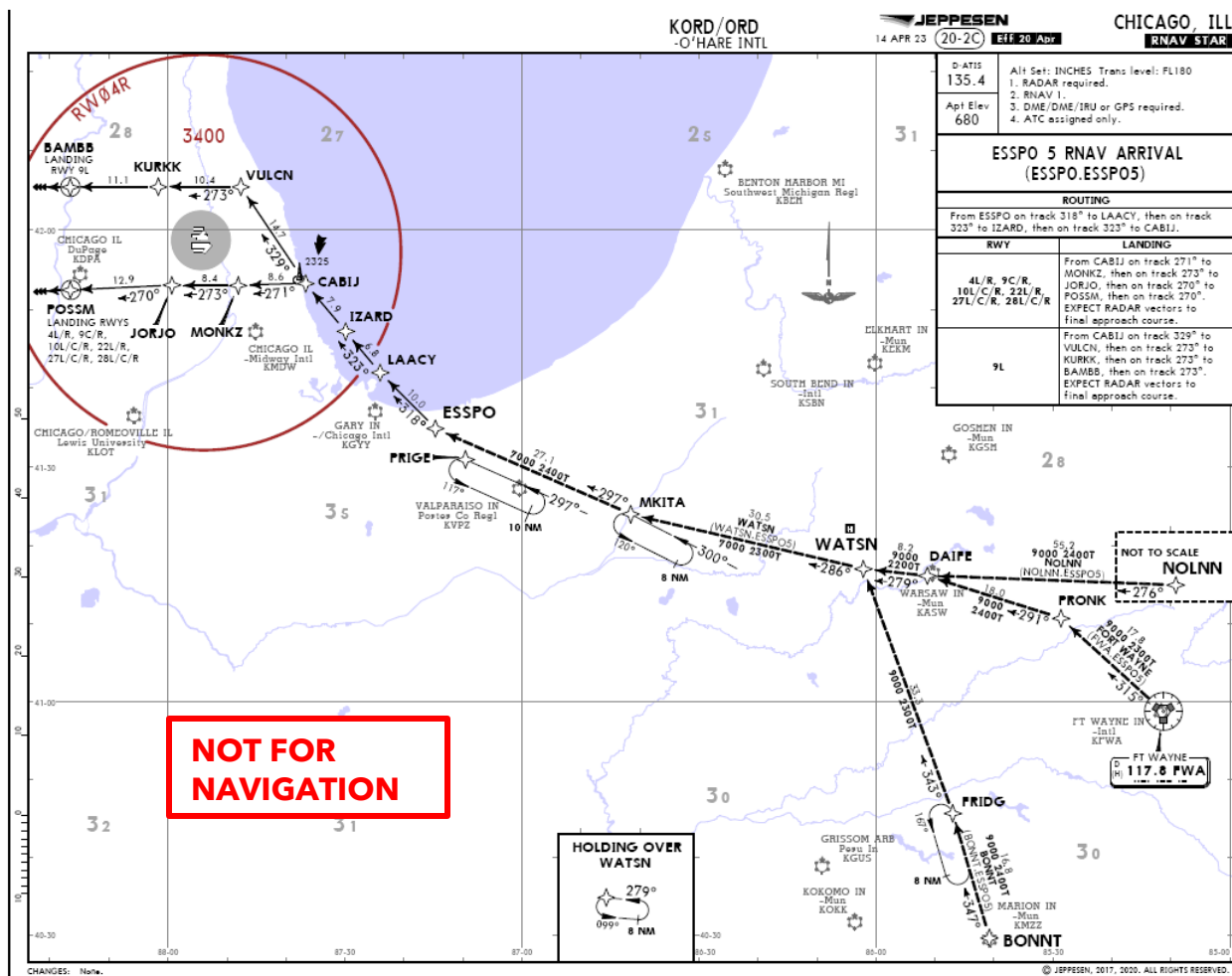


Figure 7. ESSPO5 RNAV Arrival (Source: Jeppesen)

7.3 ILS or LOC Runway 10

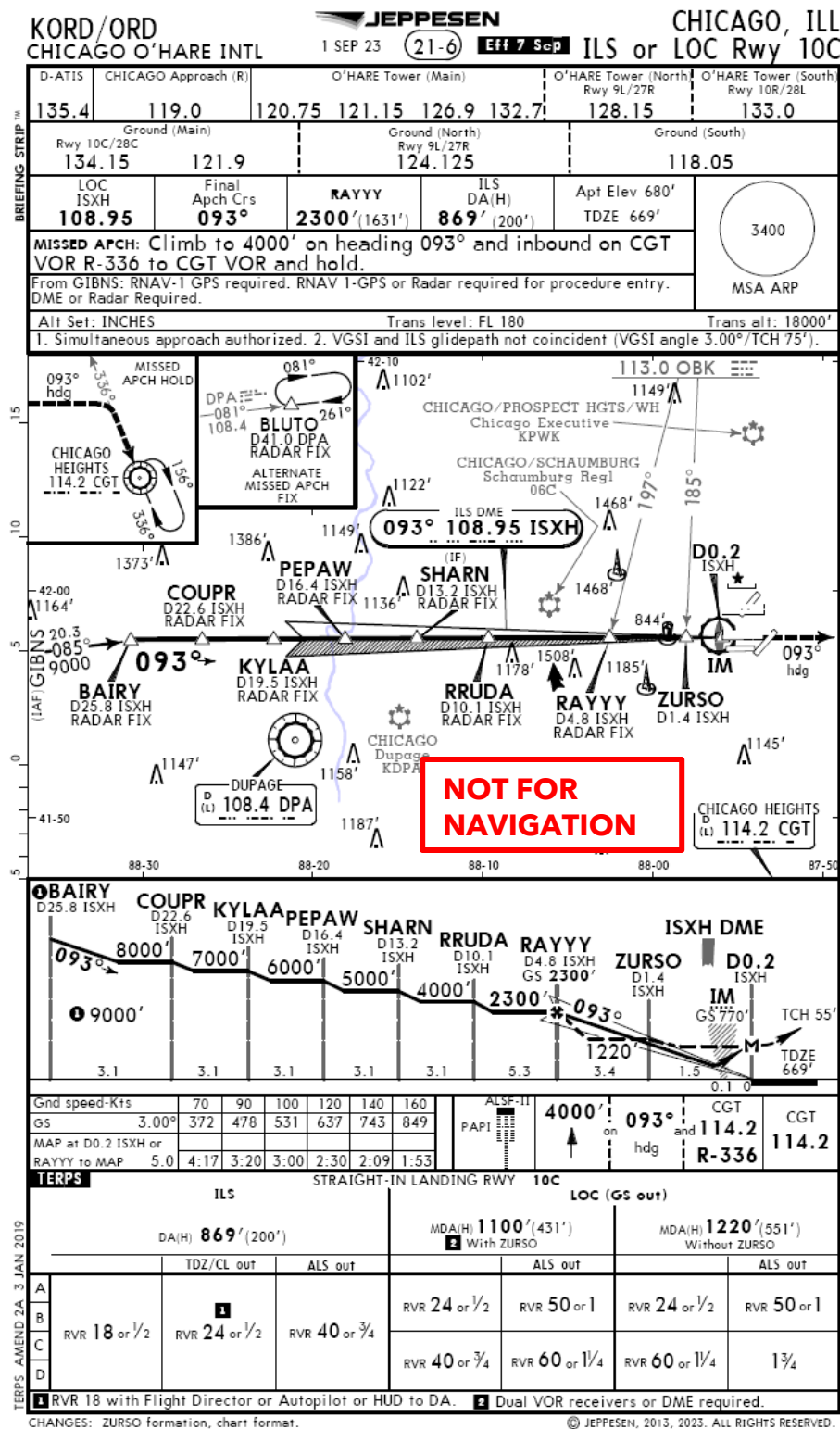


Figure 8. ORD 21-6 ILS or LOC Runway 10C (Source: Jeppesen)

8.0 METEOROLOGICAL INFORMATION

The recorded weather closest to the time of the incident was the ORD METAR²⁴, which reported the following:

Incident Landing

METAR KORD 252051Z VRB05KT 10SM SCT055 24/11 A2993 RMK AO2 SLP131 T02440106 55001 \$=

The METAR information in plain language:

ORD weather observation at 1551 CDT, wind variable at 5 kts, visibility 10 miles, scattered clouds at 5,500 ft agl²⁵, temperature 24° C, dew point temperature 11°C, altimeter setting 29.93 inches of mercury. Remarks: automated observation system with a precipitation discriminator, sea-level pressure 1013.1-hPa²⁶, temperature 24.4°C, dew point 10.6°C.

9.0 OPERATOR

Envoy Air Inc. is a wholly owned subsidiary of American Airlines Group. The headquarters are located in Irving, Texas. In 2023 Envoy Air transitioned to an all Embraer E-Jet (E175/E170) and plan on growing the fleet to 181 total airplanes by the end of 2025. Envoy provides passenger flight services under the American Eagle brand for American Airlines. Established in 1998 as American Eagle Airlines Inc., Envoy was founded after the merger of several regional carriers, consolidating into one regional airline. To distinguish itself from the American Eagle brand, the company officially changed its name to Envoy Air Inc. in 2014. In 2023, Envoy transitioned to an all-Embraer E-Jet, E175/E170 fleet.²⁷

10.0 MANUAL EXCERPTS

The captain stated when ATC assigned the ESSPO 5 RNAV arrival, they were unsure of which runway they would get assigned, but assumed they would get runway 10R, which is what he loaded into the FMS. When they checked in with the approach controller, they were assigned ILS 10C. While flying a heading to intercept the ILS 10C, the localizer frequency in Nav 1 radio was correctly tuned to 108.95 MHz, the frequency

²⁴ Aviation Routine Weather Report (METAR) Source: FAA AIM 7-1-28

²⁵ Above ground level

²⁶ Hectopascal

²⁷ Source: www.envoyair.com

for the ILS 10C localizer, for four seconds. During this four second time period the localizer and glideslope displays indicated that the correct course was to the right and above the airplane. After the four seconds Nav 1 radio was changed to 108.4 MHz and Nav 2 radio was changed to 113.0 MHz for the remainder of the flight.²⁸ The captain stated the FMS had not autotuned²⁹ the localizer frequency. He began troubleshooting and was "heads down" and by the time they reached the Final Approach Fix (FAF) the FMS had still not autotuned the localizer frequency. The captain took control of the airplane, and the first officer stated he put his head down to double-check the localizer frequency which he verified were correct. The first officer took back control of the airplane, and at this point they decided to discontinue to troubleshoot and proceeded visually to the airport. The captain did not recall seeing the PAPI³⁰ for the runway.³¹ Investigators couldn't conclusively determine if the localizer frequencies did not autotune.

10.1 Arrival Preparation

The following excerpts are from the Envoy ERJ-170/175 Aircraft Operating Manual Volume 1:

Climb, Cruise, and Descent 2e-13

Arrival Preparation 26 Jul 23

ERJ-170/175 Aircraft Operating Manual, Volume 1

2e.7 Arrival Preparation

2e.7.1 General. Accomplish the preparation items, arrival route verification, and approach briefing as early as possible (prior to top of descent, preferred), while the workload is at a minimum.

WARNING

FMS Speeds are prohibited after the final approach fix for all instrument approach types. For visual approaches, manual speeds must be selected upon final flap selection.

2e.7.2 Preparation Items.

- ATIS - Obtain
- In-range - Send via ACARS³² or Call Station via Radio
- Runway and Approach - Load FMS
- Landing Weight - Determine
- Landing Data and Speeds - Set
- PFD and NAV³³ Radios - Set

²⁸ Source: Flight Data Recorder Specialist Factual Report.

²⁹ Autotune would automatically tune the ILS frequency in the FMS.

³⁰ Precision Approach Path Indicator

³¹ See Attachment 1 - Crew Interviews and Written Statements.

³² Aircraft Communication Addressing and Reporting System.

³³ Primary Flight Display and Navigation.

- Arrival Verification - Perform
- Approach Briefing - Complete
- Arrival Announcement - Complete

ATIS Obtain

Obtain the ATIS utilizing ACARS or radio.

If ACARS is inoperative, accomplish a voice in-range call to station operations which includes, as necessary:

- ETA³⁴
- Passenger support requirements (wheelchairs, meet-and-assist, etc.)
- Maintenance difficulties requiring attention (MELs³⁵ or other mechanical irregularities requiring maintenance personnel.)

Runway and Approach Load FMS

Load the expected Runway and Approach (NAV>ARRIVAL) into the FMS.

Landing Weight Determine

PROG³⁶ 2/3 lists the current weight. PERF³⁷>PERF DATA or LANDING 1/2 lists the FMS predicted landing weight. Verify runway is acceptable for landing, see QRH³⁸.

If approach is based on ground station navigational guidance:

1. HSI³⁹ Course Arrow Set
 - a. PREV or V/L⁴⁰ (as required).....Select
 - b. CRS⁴¹ Set
2. NAV Radios..... Set

Set appropriate frequencies on MCDU⁴² RADIO page.

Arrival Verification. This procedure ensures the arrival and approach are loaded correctly into the FMS and cross-checked against the charted procedures. If flying an RNAV arrival, the procedure must be retrieved from the FMS database. Do not enter the waypoints manually.

Once the arrival and approach are entered into the FMS and prior to the top of descent (when possible), both pilots will perform an arrival verification individually. Ensure that all charted fixes, and altitude and speed constraints are accurately displayed in the FMS according to the anticipated arrival and approach clearance.

If any route fixes or constraints are missing, resolve or reload the arrival/approach and reverify it. Notify ATC if any issues remain.

³⁴ Estimated Time of Arrival.

³⁵ Minimum Equipment List.

³⁶ Progress.

³⁷ Performance.

³⁸ Quick Reference Handbook.

³⁹ Horizontal Situation Indicator.

⁴⁰ VOR/Localizer

⁴¹ Course.

⁴² Multi-Function Control and Display Unit.

Changes. *If an arrival, runway, or approach change is assigned and entered into the FMS after the Arrival Verification is completed, perform another Arrival Verification. In the event workload prohibits a complete Arrival Verification, at least one pilot will ensure the FMS routing and constraints are correct.*

10.2 Approach Briefing

2e.7.3 Approach Briefing. *The approach briefing is completed by the Pilot-Flying prior to top of descent, to the extent possible, to minimize distractions in high-density operations at lower altitudes. The Captain will ensure the briefing includes all additional information that is needed for the specific approach (e.g., weather, crewmember experience, special qualification airports, etc.). Each pilot is responsible for reviewing the applicable approach chart. Set-up for the instrument approach, if available. Crosscheck the Jeppesen page against the FMS data for the arrival, approach and missed approach. The arrival briefing consists of the following items which must be verified/cross-checked by both pilots:*

- *FMS: Arrival, arrival transition, approach transition (if applicable) and approach.*

- *Top of descent point*

If in night conditions or weather less than 2000/3:

- *Approach name and runway*
- *Approach chart date*
- *Primary NAVAID frequency*
- *Final approach course*
- *Final approach verification altitude*
- *Approach minimum*
- *TDZE*
- *Missed approach*
- *Required visibility*

If in day conditions with weather 2000/3 or greater:

- *Electronic/visual means to identify runway.*

For all arrivals/approaches:

- *Pilot-Flying*
- *MEL item(s)*
- *Highest MSA*
- *Planned runway turnoff and taxi route/hot spots/runway crossings*

- **Note •**

Actual taxi route may be different.

- *Landing performance*
- *Landing flap setting*

11.0 Go-Around

The following excerpt was from the Envoy Flight Operations Manual (FOM) Chapter 10 Go-Around, page 10g-2:

Envoy has a no-fault go-around policy. Pilots should execute every approach with the presumption that a missed approach is a successful outcome. Plan each approach through the missed-approach procedure and make the decision to land only when all criteria are safely satisfied.

Missed-approach decision: The Captain has "full control and authority in the operation of the aircraft", however the Captain should give every consideration to a recommendation by another Flighdeck crewmember that a missed approach be executed.

12.0 FMS Autotune

The following excerpt was from Honeywell Pilots Guide REV 8:

Autotune

The tuning mode is in autotune when the FMS is tuning the VOR. To select autotune, follow Procedure 6--15.

In autotuning, the FMS automatically selects a NAVAID, tunes it, and checks the data from the NAVAID. No pilot--interaction is required.

During autotuning, the FMS tunes the VOR the pilot would most likely tune when possible. When the VOR is required for navigation, the FMS tunes the VOR so the most optimum VOR/DME position is established.

The FMS autotunes the localizer frequency for localizer--based approaches. For localizer autotuning, frequency confirmation from the NAV receiver is performed, but the data is not checked by the FMS. The pilot must rely on the primary instrument flags to determine the validity of the signals.

Step Procedure 6--15 NAV Tuning by Selecting Autotune

- 1. Confirm that the VOR radio is not selected as the navigation source on either side EDS. This includes the VOR mode, ILS mode, or preview mode.*
- 2. Confirm that the VOR radio is in the manual tune mode.*
- 3. Select PROG from the MCDU panel.*

NAV Tuning

Autotune is indicated by the magenta NAV active frequency on the PFD and green FMS AUTO on the adjacent field to the active NAV frequency on the MCDU RADIO page.

When VOR or LOC is selected as the navigation source on EDS with

autotuning active, autotuning ceases and manual tune is shown on the PFD active NAV frequency in green. FMS AUTO is removed from the MCDU RADIO page.

With autotuning active, when Preview is selected, autotuning discontinues. However the PFD and MCDU RADIO pages continue to indicate autotune. When Preview is deselected, autotuning resumes. In Preview mode, the FMS automatically tunes the ILS specified in the arrival procedure when either the aircraft sequences onto an active ILS approach procedure leg or the aircraft is within 30 NM of the destination runway. This is indicated by the PFD active NAV frequency shown in green and FMS AUTO removed from the MCDU RADIO page.

Manual Tuning

The tuning mode is manual when the pilot has tuned the NAV radios through the FMS or from another radio tuning source. The FMS does not make changes to the frequency the pilot has selected. Radio tune sources are the PFD, RADIO page on the MCDU and the PROGRESS page.

When the FMS is not in DUAL mode, the FMS cannot tune the VOR or associated DME channel. Tuning is done by the pilot through:

- *The radio tune sources on the PFD, MCDU radio page*
- *The on--side NAV radio, FMS PROGRESS page.*

Therefore, when NOT in DUAL, the off--side NAV radio cannot be tuned by the PROGRESS page. The FMS still tunes the blind channels of the scanning DME during this mode.

E. LIST OF ATTACHMENTS

Attachment 1 – Crew Interviews and Written Statements
Attachment 2 – Weight and Balance
Attachment 3 – Landing Distance Calculation
Attachment 4 – Dispatch Release
Attachment 5 – Pilot Training Records
Attachment 6 – Visual Approach Training (postincident)

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