

FEDERAL AVIATION ADMINISTRATION
FLIGHT STANDARDS SERVICE
STANDARD TERMINAL ARRIVAL (STAR)

Bearings, headings, courses, tracks and radials are magnetic. Elevations and altitudes are in feet, MSL. Altitudes are minimum altitudes unless otherwise indicated.
Ceilings are in feet above airport elevation. Distances are in nautical miles. Visibilities are in statute miles or feet RVR unless otherwise indicated.

Arrival Name	Number	STAR Computer Code	Superseded Number	Dated	Effective Date
MUSCL (RNAV)	FOUR	MUSCL.MUSCL4	THREE	01/05/2017	

TRANSITION ROUTES:

Transition Name	Transition Computer Codes	From FIX/NAVAID	To FIX/NAVAID	Course	Distance	MEA	MOCA	MAA	Crossing Altitudes / Fixes
CEWDA	CEWDA.MUSCL4	CEWDA	CEWDA						
			SHEAY	274.80	65.41	12000	3600		
			CMARO	277.15	26.42	10000	3200		AT/ABOVE FL240
			JERMN	276.76	32.86	8000	3200		AT/ABOVE FL220
			MUSCL	276.20	13.57	6000	3200		AT/ABOVE 17000
CMARO	CMARO.MUSCL4	CMARO	CMARO						AT/ABOVE FL240
			JERMN	276.76	32.86	8000	3200		AT/ABOVE FL220
			MUSCL	276.20	13.57	6000	3200		AT/ABOVE 17000
IDIOM	IDIOM.MUSCL4	IDIOM	IDIOM						
			SHEAY	287.50	79.56	10000	3600		
			CMARO	277.15	26.42	10000	3200		AT/ABOVE FL240
			JERMN	276.76	32.86	8000	3200		AT/ABOVE FL220
			MUSCL	276.20	13.57	6000	3200		AT/ABOVE 17000
JERMN	JERMN.MUSCL4	JERMN	JERMN						AT/ABOVE FL220
			MUSCL	276.20	13.57	6000	3200		AT/ABOVE 17000
SHEAY	SHEAY.MUSCL4	SHEAY	SHEAY						
			CMARO	277.15	26.42	10000	3200		AT/ABOVE FL240
			JERMN	276.76	32.86	8000	3200		AT/ABOVE FL220
			MUSCL	276.20	13.57	6000	3200		AT/ABOVE 17000

ARRIVAL ROUTE DESCRIPTION:

FROM MUSCL ON TRACK 275.97/18.73 TO CROSS BAYKS AT OR ABOVE 12000 AND AT 280 KIAS, THEN ON TRACK 257.61/15.61 TO WOLVS.

LANDING RWY 4, 12L, 17, 22: FROM WOLVS ON TRACK 257.38/6.03 TO CROSS LOON AT OR ABOVE 11000, THEN ON TRACK 257.23/9.97 TO CROSS WDBRY AT OR ABOVE 10000 AND AT 250 KIAS, THEN ON TRACK 257.19/4.00 TO CROSS ZASKY AT OR ABOVE 9000, THEN ON TRACK 301.35/3.55 TO CROSS CMMOE AT 8000 AND AT 230 KIAS, THEN ON TRACK 300.77/2.47 TO CROSS FSCOT AT 8000 AND AT 230 KIAS, THEN ON TRACK 300.77. EXPECT RADAR VECTORS TO FINAL APPROACH COURSE.

LANDING RWY 12R, 35: FROM WOLVS ON TRACK 257.38/6.03 TO CROSS LOON AT OR ABOVE 11000, THEN ON TRACK 257.23/9.97 TO CROSS WDBRY AT OR ABOVE 10000 AND AT 250 KIAS, THEN ON TRACK 257.19/4.00 TO CROSS ZASKY AT OR ABOVE 9000, THEN ON TRACK 238.64/14.36 TO CROSS GREK AT 8000 AND AT 230 KIAS, THEN ON TRACK 301.32/2.25 TO CROSS TIETN AT 8000 AND AT 230 KIAS, THEN ON TRACK 301.32. EXPECT RADAR VECTORS TO FINAL APPROACH COURSE.

LANDING RWY 30L/R: FROM WOLVS ON TRACK 224.21/3.07 TO CROSS LKLND AT OR ABOVE 8000, THEN ON TRACK 224.22/6.48 TO CROSS KROIX AT 7000 AND AT 230 KIAS, THEN ON TRACK 224.14/2.00 TO CROSS TRTEL AT 7000 AND AT 210 KIAS. EXPECT RNAV (RNP), RNAV (GPS), OR ILS RWY 30R APPROACH OR RADAR VECTORS TO RWY 30L/R FINAL APPROACH COURSE.

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PBN REQUIREMENT NOTES:

RNAV 1 - DME/DME/IRU OR GPS

EQUIPMENT REQUIREMENT NOTES:

RADAR REQUIRED

PROCEDURAL DATA NOTES:

NOTE: JET AIRCRAFT ONLY

NOTE: EXPECT "DESCEND VIA" CLEARANCE AND RUNWAY TRANSITION ASSIGNMENT BY CENTER. APPROACH WILL ASSIGN LANDING RUNWAY.

NOTE: JET AIRCRAFT DESCEND VIA MACH NUMBER UNTIL 280K, IF UNABLE, ADVISE ATC.

FIXES AND/OR HOLDING PATTERNS:

CHART HOLDING AT JERMN: HOLD E, RT, 276.76 INBOUND, 10 NM LEGS.

CHART HOLDING AT SHEAY: HOLD E, RT, 274.80 INBOUND, 10 NM LEGS.

COMMUNICATIONS:

CHART: MINNEAPOLIS CENTER

AIRPORTS SERVED:

<u>AIRPORT ID</u>	<u>CITY</u>	<u>STATE</u>
MSP	MINNEAPOLIS	MN

LOST COMMUNICATIONS PREFERENCES:

REMARKS:

3200 MOCA IN ENROUTE TRANSITIONS DUE TO OBSTACLE IN COMMON ROUTE.

"DESCEND VIA" CLEARANCE VERBIAGE PER ATC REQUEST.

ADDITIONAL FLIGHT DATA:

DME/DME ASSESSMENT: SAT (RNP 2.0)

MAG VAR: MSP 00E/2015

CHART AT FSCOT TERMINUS: MSP LDG RWY 4, 12L, 17, 22

CHART AT TRTEL TERMINUS: MSP LDG RWY 30L/R

CHART AT TIETN TERMINUS: MSP LDG RWY 12R, 35

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Arrival Name	Number	STAR Computer Code	Superseded Number	Dated	Effective Date
MUSCL (RNAV)	FOUR	MUSCL.MUSCL4	THREE	01/05/2017	

FLIGHT INSPECTED BY:

ORGANIZATION: **DATE:**

Flight Inspected Signature: _____

DEVELOPED BY:

CASIMIR TABAKA (BARBARA GORMAN)

AJV-A432

01/30/2025

Developed By Signature: _____

APPROVED BY:

CASIMIR TABAKA

AJV-A430

Approved By Signature: _____

CHANGES:

1. TRANSITION ROUTES: MEAS AND MOCAS UPDATED.
2. REMOVED MEAS AND MOCAS FROM ARRIVAL ROUTE DESCRIPTION.
3. LANDING RWY 4, 12L, 17, 22: UPDATED "THEN ON TRACK 301.18/3.75 TO CROSS CMMOE" TO "THEN ON TRACK 301.35/3.55 TO CROSS CMMOE."
4. LANDING RWY 4, 12L, 17, 22: UPDATED "THEN ON TRACK 301.29/10.62 TO COZZZ, THEN ON TRACK 301.29" TO "THEN ON TRACK 300.77/2.47 TO CROSS FSCOT AT 8000 AND AT 230 KIAS, THEN ON TRACK 300.77."
5. LANDING RWY 12R, 35: UPDATED "THEN ON TRACK 300.82/11.19 TO DOLEE, THEN ON TRACK 300.82" TO "THEN ON TRACK 301.32/2.25 TO CROSS TIETN AT 8000 AND AT 230 KIAS, THEN ON TRACK 301.32."
6. LANDING RWY 30R/L: UPDATED VERBIAGE FROM "EXPECT RNAV(RNP), RNAV(GPS), OR ILS OR RADAR VECTORS TO FINAL APPROACH COURSE" TO "EXPECT RNAV (RNP), RNAV (GPS), OR ILS RWY 30R APPROACH OR RADAR VECTORS TO RWY 30L/R FINAL APPROACH COURSE."
7. PROCEDURAL DATA NOTES: MOVED RADAR REQUIRED TO EQUIPMENT REQUIREMENT NOTES; COMBINED AND MOVED RNAV 1, DME/DME/IRU OR GPS REQUIRED TO PBN REQUIREMENT NOTES.
8. CHANGED TURBOJET TO JET IN SPEED CAPABILITY NOTE.
9. UPDATED NOTE: FROM "TURBOJET AIRCRAFT DESCEND VIA MACH NUMBER UNTIL INTERCEPTING 280K. MAINTAIN 280K UNTIL SLOWED BY THE STAR OR ASSIGNED BY ATC" TO "JET AIRCRAFT DESCEND VIA MACH NUMBER UNTIL 280K, IF UNABLE, ADVISE ATC."
10. REMOVED CHART: MSP ATIS, AND MSP APP CON.
11. ADDED AIRPORT ID AND REMOVED AIRPORT NAMES FROM AIRPORTS SERVED ALONG WITH K IDENT ON 17.1 FORM.
12. ADDED TERMINUS INFO TO ADDITIONAL FLIGHT DATA.
13. ADDED REMARK: 3200 MOCA IN ENROUTE TRANSITIONS DUE TO OBSTACLE IN COMMON ROUTE.
14. REMOVED RECOMMENDED NAVAID FROM 17.2 FORM.

REASONS:

1. MEAS AMENDED TO LOWEST ALTITUDE THAT WILL PASS A DME/DME SCREEN AND MOCAS UPDATED TO CURRENT REQUIREMENTS.
2. NO LONGER A REQUIREMENT.
3. MOVED FIX CMMOE WP .2 NM PER FPT/ATC.
4. FIX COZZZ REPLACED WITH FIX FSCOT TO CONNECT TO MSP IAPS; TO MAINTAIN CURRENT TRACK AFTER FSCOT.
5. FIX DOLEE REPLACED WITH FIX TIETN TO CONNECT TO MSP IAPS; TO MAINTAIN CURRENT TRACK AFTER TIETN.
6. UPDATED VERBIAGE IAW 8260.19J.
7. PER 8260.19J CRITERIA STANDARDS DOCUMENTATION.
8. IAW 8260.19J 4-5-12 D3(A).
9. IAW 8260.19J 4-5-2 F.

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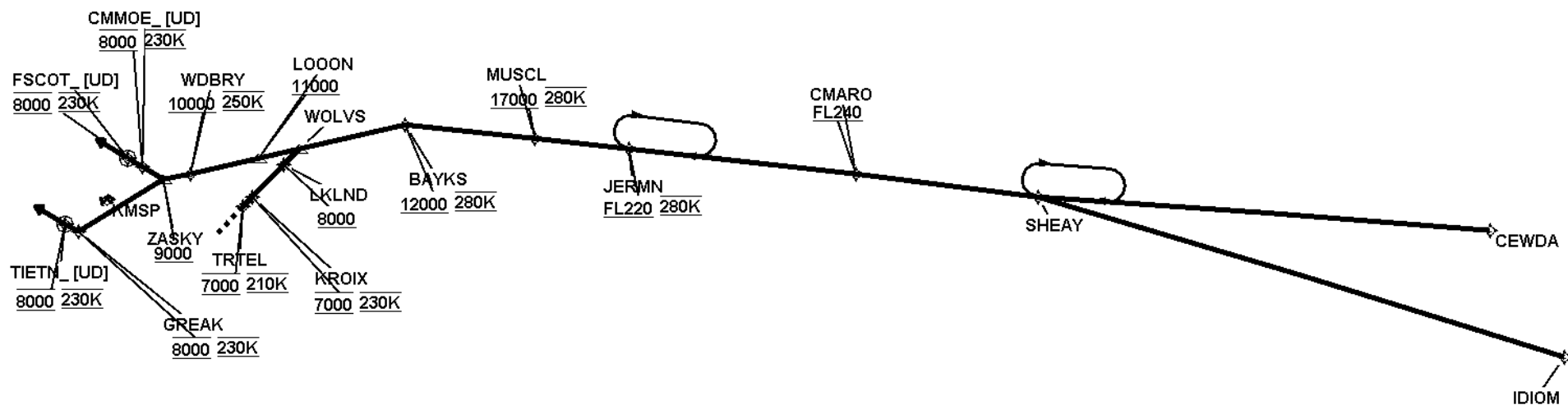
Arrival Name	Number	STAR Computer Code	Superseded Number	Dated	Effective Date
MUSCL (RNAV)	FOUR	MUSCL.MUSCL4	THREE	01/05/2017	
10. AUTOMATICALLY CHARTED IAW 8260.16J 4-5-12(F).					
11. PER 8260.19J DOCUMENTATION STANDARDS.					
12. 8260.19J 4-5-2 H(2).					
13. ADDED TO CLARIFY MOCA INCREASE IN ENROUTE TRANSITION.					
14. CURRENT DOCUMENTATION STANDARDS.					



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Arrival Name	Number	STAR Computer Code	Superseded Number	Dated	Effective Date
MUSCL (RNAV)	FOUR	MUSCL.MUSCL4	THREE	01/05/2017	
Graphic Depiction 1					



**FEDERAL AVIATION ADMINISTRATION
FLIGHT STANDARDS SERVICE
STAR (DATA RECORD)**

Arrival Name MUSCL (RNAV)	Number FOUR		STAR Computer Code MUSCL.MUSCL4		Superseded Number THREE		Dated 01/05/2017		Effective Date
<u>FIX/NAVAID</u>	<u>LAT/LONG</u>	<u>C</u>	<u>FO/FB</u>	<u>LEG TYPE</u>	<u>TC</u>	<u>DIST (NM)</u>	<u>ALTITUDE</u>	<u>SPEED</u>	<u>REMARKS</u>
En Route Transition									
CEWDA	444832.00N / 0883300.00W	Y		IF					CEWDA.MUSCL4
SHEAY	445323.43N / 0900441.41W	Y	FB	TF	274.80	65.41			
CMARO	445634.79N / 0904135.78W	Y	FB	TF	277.15	26.42	AT/ABOVE FL240		
JERMN	450017.45N / 0912735.23W	Y	FB	TF	276.76	32.86	AT/ABOVE FL220	AT 280K	
MUSCL	450143.75N / 0914636.60W	Y	FB	TF	276.20	13.57	AT/ABOVE 17000	AT 280K	
En Route Transition									
CMARO	445634.79N / 0904135.78W	Y		IF			AT/ABOVE FL240		CMARO.MUSCL4
JERMN	450017.45N / 0912735.23W	Y	FB	TF	276.76	32.86	AT/ABOVE FL220	AT 280K	
MUSCL	450143.75N / 0914636.60W	Y	FB	TF	276.20	13.57	AT/ABOVE 17000	AT 280K	
En Route Transition									
IDIOM	443018.00N / 0881757.00W	Y		IF					IDIOM.MUSCL4
SHEAY	445323.43N / 0900441.41W	Y	FB	TF	287.50	79.56			
CMARO	445634.79N / 0904135.78W	Y	FB	TF	277.15	26.42	AT/ABOVE FL240		
JERMN	450017.45N / 0912735.23W	Y	FB	TF	276.76	32.86	AT/ABOVE FL220	AT 280K	
MUSCL	450143.75N / 0914636.60W	Y	FB	TF	276.20	13.57	AT/ABOVE 17000	AT 280K	
En Route Transition									
JERMN	450017.45N / 0912735.23W	Y		IF			AT/ABOVE FL220	AT 280K	JERMN.MUSCL4
MUSCL	450143.75N / 0914636.60W	Y	FB	TF	276.20	13.57	AT/ABOVE 17000	AT 280K	
En Route Transition									
SHEAY	445323.43N / 0900441.41W	Y		IF					SHEAY.MUSCL4
CMARO	445634.79N / 0904135.78W	Y	FB	TF	277.15	26.42	AT/ABOVE FL240		
JERMN	450017.45N / 0912735.23W	Y	FB	TF	276.76	32.86	AT/ABOVE FL220	AT 280K	
MUSCL	450143.75N / 0914636.60W	Y	FB	TF	276.20	13.57	AT/ABOVE 17000	AT 280K	

**FEDERAL AVIATION ADMINISTRATION
FLIGHT STANDARDS SERVICE
STAR (DATA RECORD)**

Arrival Name MUSCL (RNAV)	Number FOUR		STAR Computer Code MUSCL.MUSCL4		Superseded Number THREE		Dated 01/05/2017	Effective Date	
<u>FIX/NAVAID</u>	<u>LAT/LONG</u>	<u>C</u>	<u>FO/FB</u>	<u>LEG TYPE</u>	<u>TC</u>	<u>DIST (NM)</u>	<u>ALTITUDE</u>	<u>SPEED</u>	<u>REMARKS</u>
Common Route									
MUSCL	450143.75N / 0914636.60W	Y		IF			AT/ABOVE 17000	AT 280K	MUSCL.MUSCL4
BAYKS	450337.67N / 0921253.65W	Y	FB	TF	275.97	18.73	AT/ABOVE 12000	AT 280K	
WOLVS	450014.73N / 0923422.91W	Y	FB	TF	257.61	15.61			
Runway Transition									
WOLVS	450014.73N / 0923422.91W	Y		IF					
LOOON	445855.32N / 0924240.72W	Y	FB	TF	257.38	06.03	AT/ABOVE 11000		
WDBRY	445642.40N / 0925621.76W	Y	FB	TF	257.23	09.97	AT/ABOVE 10000	AT 250K	
ZASKY	445549.08N / 0930151.18W	Y	FB	TF	257.19	04.00	AT/ABOVE 9000		
CMMOE	445739.87N / 0930607.55W	Y	FB	TF	301.35	03.55	AT 8000	AT 230K	
FSCOT	445855.65N / 0930906.94W	Y	FO	TF	300.77	02.47	AT 8000	AT 230K	
KMSP:R04, R12L, R17, R22				FM	300.77				
Runway Transition									
WOLVS	450014.73N / 0923422.91W	Y		IF					
LOOON	445855.32N / 0924240.72W	Y	FB	TF	257.38	06.03	AT/ABOVE 11000		
WDBRY	445642.40N / 0925621.76W	Y	FB	TF	257.23	09.97	AT/ABOVE 10000	AT 250K	
ZASKY	445549.08N / 0930151.18W	Y	FB	TF	257.19	04.00	AT/ABOVE 9000		
GREAK	444819.40N / 0931904.57W	Y	FB	TF	238.64	14.36	AT 8000	AT 230K	
TIETN	444929.62N / 0932146.79W	Y	FO	TF	301.32	02.25	AT 8000	AT 230K	
KMSP:R12R, R35				FM	301.32				
Runway Transition									
WOLVS	450014.73N / 0923422.91W	Y		IF					
LKLND	445802.53N / 0923724.03W	Y	FB	TF	224.21	03.07	AT/ABOVE 8000		
KROIX	445323.70N / 0924345.43W	Y	FB	TF	224.22	06.48	AT 7000	AT 230K	
TRTEL	445157.46N / 0924543.09W	Y	FB	TF	224.14	02.00	AT 7000	AT 210K	
KMSP:R30R, R30L									