

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Arrival Name	Number	STAR Computer Code	Superseded Number	Dated	Effective Date
WWAVS (RNAV)	TWO	SERFR.WWAVS2	ONE	12/10/2015	

TRANSITION ROUTES:

Transition Name	Transition Computer Codes	From FIX/NAVAID	To FIX/NAVAID	Course	Distance	MEA	MOCA	MAA	Crossing Altitudes / Fixes
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**ARRIVAL ROUTE DESCRIPTION:**

FROM SERFR ON TRACK 313.71/30.32 TO CROSS NRRLI AT OR ABOVE FL200 AND AT 280 KIAS, THEN ON TRACK 313.49/17.48 TO CROSS WWAVS BETWEEN 15000 AND FL190 AND AT 280 KIAS.

LANDING RWY 10L/R: FROM WWAVS ON TRACK 305.87/29.67 TO CROSS WPOUT AT 11000 AND AT 250 KIAS, THEN ON TRACK 304.72/30.75 TO CROSS PLLAR AT 6000 AND AT 210 KIAS, THEN ON TRACK 310.00. EXPECT RADAR VECTORS TO FINAL APPROACH COURSE.

LANDING RWY 19L/R: FROM WWAVS ON TRACK 305.87/29.67 TO CROSS WPOUT AT 11000 AND AT 250 KIAS, THEN ON TRACK 330.68/23.76 TO CROSS THEEZ AT OR ABOVE 8000 AND AT 230 KIAS, THEN ON TRACK 330.66/10.10 TO CROSS WESLA AT 6000 AND AT 210 KIAS, THEN ON TRACK 001.78/4.52 TO CROSS MVRKK AT 6000, THEN ON TRACK 000.00. EXPECT RADAR VECTORS TO FINAL APPROACH COURSE.

**PBN REQUIREMENT NOTES:**

RNAV 1 - DME/DME/IRU OR GPS

**EQUIPMENT REQUIREMENT NOTES:**

RADAR REQUIRED

**PROCEDURAL DATA NOTES:**

**FIXES AND/OR HOLDING PATTERNS:**

CHART HOLDING AT NRRLI: HOLD SE, LT, 313.71 INBOUND, 10 NM LEGS.

CHART HOLDING AT SERFR: HOLD SE, LT, 313.71 INBOUND, 10 NM LEGS.

CHART HOLDING AT WPOUT: HOLD SE, LT, 305.87 INBOUND, 10 NM LEGS.

CHART HOLDING AT WWAVS: HOLD SE, LT, 313.49 INBOUND, 10 NM LEGS.

CHART: STOKD.

CHART: MAKRS.



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WWAVS (RNAV)	TWO	SERFR.WWAVS2	ONE	12/10/2015	

COMMUNICATIONS:

- CHART: OAK ARTCC.
- CHART: NORCAL APPCH CON.
- CHART: SFO TWR.
- CHART: SFO GND CON.

AIRPORTS SERVED:

AIRPORT ID	CITY	STATE
KSFO	SAN FRANCISCO	CA

LOST COMMUNICATIONS PREFERENCES:

REMARKS:

ADDITIONAL FLIGHT DATA:

- DME/DME ASSESSMENT: SAT (RNP 2.0)
- MAG VAR: KSFO 14E/2015.
- CHART AT MVRKK TERMINUS: KSFO LDG RWY 19L/R.
- CHART AT PLLAR TERMINUS: KSFO LDG RWY 10L/R.

Digitally signed by  
ERIC N SUSKI  
May 23, 2024

FLIGHT INSPECTED BY:

THOMAS E MOLOKIE

ORGANIZATION: DATE:

FPO 05/21/2024

Flight Inspected Signature:

DEVELOPED BY:

PARNELL PRASSADA

AJV-A431 10/17/2023

Developed By Signature:

Digitally signed by  
ERIC N SUSKI

APPROVED BY:

JOHNNIE BAKER

AJV-A430

Approved By Signature:

Nov 03, 2023  
Digitally signed by  
ERIC N SUSKI  
Nov 03, 2023

CHANGES:

- MOVED THEEZ WP 609 FT SOUTH.
- CHANGED SPEED RESTRICTION AT THEEZ WP FROM 240 KIAS TO 230 KIAS.
- ADDED STAR TERMINUS ALTITUDE RESTRICTION OF AT 6000 AT MVRKK WP.
- ADDED RWY 10L/R RUNWAY TRANSITION.
- ADDED PLLAR WP WITH ALTITUDE RESTRICTION OF AT 6000 AND SPEED RESTRICTION OF AT 210 KIAS AND FM LEG ON TRACK 310°.
- ADDED RNAV 1 AND DME/DME/IRU OR GPS REQUIRED TO PBN REQUIREMENT NOTES.



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Arrival Name	Number	STAR Computer Code	Superseded Number	Dated	Effective Date
<b>WWAVS (RNAV)</b>	<b>TWO</b>	<b>SERFR.WWAVS2</b>	<b>ONE</b>	<b>12/10/2015</b>	

7. ADDED RADAR REQUIRED TO EQUIPMENT REQUIREMENT NOTES.
8. DELETED D-ATIS FROM COMMUNICATIONS.
9. ADDED CHART AT MVRKK: KSFO LDG RWY 19L/R.
10. ADDED CHART AT PLLAR: KSFO LDG RWY 10L/R.
11. ADDED RUNWAY 10L/R TO ARRIVAL ROUTE DESCRIPTION: LANDING RWY 10L/R: FROM WWAVS ON TRACK 305.87/29.67 TO CROSS WPOUT AT 11000 AND AT 250 KIAS, THEN ON TRACK 304.72/30.75 TO CROSS PLLAR AT 6000 AND AT 210 KIAS, THEN ON TRACK 310.00. EXPECT RADAR VECTORS TO FINAL APPROACH COURSE.
12. REMOVED ALL MEA AND MOCA VALUES FROM COMMON ROUTE AND RUNWAY TRANSITIONS.
13. REMOVED "DO NOT CHART MOCAS" FROM ADDITIONAL FLIGHT DATA.
14. REMOVED "RECOMMENDED NAVAID: EHF VORTAC."

**REASONS:**

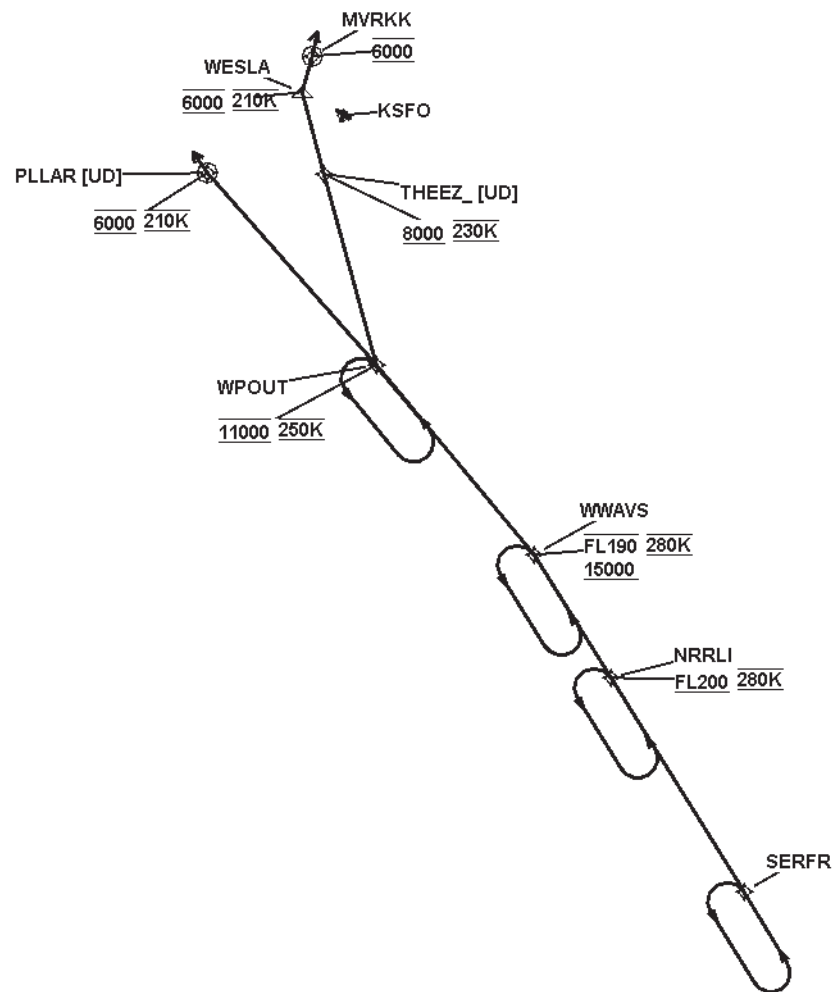
- 1-2. FOR DESCENT GRADIENT CRITERIA.
3. IAW FAAO 8260.19I 4-5-2 (J).
- 4-5. PER ATC REQUEST; IAW FAAO 8260.19I 4-5-2 (T).
- 6-8. IAW FAAO 8260.19I 4-5-3.
- 9-10. IAW FAAO 8260.19I 4-5-2 (H)(2).
- 11-12. IAW FAAO 8260.19I 4-5-12 (C).
13. IAW 8260.19I, 4-5-12 (B)(8).
14. NOT REQUIRED IAW 8260.19I, 4-5-12 (C).



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WWAVS (RNAV)	TWO	SERFR.WWAVS2	ONE	12/10/2015	
Graphic Depiction 1					



FEDERAL AVIATION ADMINISTRATION  
FLIGHT STANDARDS SERVICE  
STAR (DATA RECORD)

Arrival Name WWAVS (RNAV)	Number TWO		STAR Computer Code SERFR.WWAVS2		Superseded Number ONE		Dated 12/10/2015		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									
SERFR	360405.90N / 1212152.79W	Y		IF					SERFR.WWAVS2
NRRLI	362944.16N / 1214157.84W	Y	FB	TF	327.71	30.32	AT/ABOVE FL200	AT 280K	
WWAVS	364429.51N / 1215339.24W	Y	FB	TF	327.49	17.48	15000BFL190	AT 280K	
Runway Transition									
WWAVS	364429.51N / 1215339.24W	Y		IF			15000BFL190	AT 280K	
WPOUT	370710.15N / 1221733.87W	Y	FB	TF	319.87	29.67	AT 11000	AT 250K	
PLLAR	373015.79N / 1224303.60W	Y	FO	TF	318.72	30.75	AT 6000	AT 210K	
KSFO:RWY 10L,RWY 10R				FM	324.00				
Runway Transition									
WWAVS	364429.51N / 1215339.24W	Y		IF			15000BFL190	AT 280K	
WPOUT	370710.15N / 1221733.87W	Y	FB	TF	319.87	29.67	AT 11000	AT 250K	
THEEZ	373006.69N / 1222527.11W	Y	FB	TF	344.68	23.76	AT/ABOVE 8000	AT 230K	
WESLA	373951.74N / 1222849.05W	Y	FB	TF	344.66	10.10	AT 6000	AT 210K	
MVRKK	374413.10N / 1222716.02W	Y	FO	TF	015.78	04.52	AT 6000		
KSFO:RWY 19L,RWY 19R				FM	014.00				

