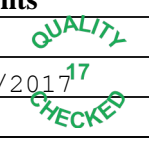


Flight Procedure Tracking Form		Action: FLIGHT CHECK	Task Type: STAR	Date Open: 02/17/2017	Task #: 2016120928982203002	Request #: 20161209289822
Procedure: STAR SERFR (RNAV) THREE SAN FRANCISCO CA KSFO			Airport ID: KSFO	Airport: SAN FRANCISCO INTL	Reimbursable #: NO	
City: SAN FRANCISCO	ST: CA	GPS #:	Estimated Chart Date: 02/01/2018		FICO #:	
Fac ID: N/A		Fac. Type:		Specialist: JEFF ANDERSON		
Procedure Review						
	Rec'd	Rel'd	Full Name	Comments		
Lead:	08/11/2017					
QA:						
Liaison:						
Procedure Comments:			ENROUTE	Remark Type: INFORMATION		
APPROVAL REQUEST (1): DESCENT GRADIENT. CONTACT: CASIMIR TABAKA, AJV-5443, (405) 954-7931.						



Federal Aviation Administration

Memorandum

Date:

To: Bruce DeCleen, Manager, Flight Technologies and Procedures Division
THRU: David G. Parker, Acting Manager, Flight Procedure Team, FAA,
ATO Western Service Center, Operations Support Group, AJV-24

From: Deborah Price, Acting Manager, Domestic Airspace, Oakland ARTCC

Subject: Approval Request: San Francisco International Airport, KSFO

This request is for approval of the Descent Gradient 389 FT PER NM from WWAVS to EPICK. The requirement in Order 8260.3C, paragraph 2-2-1.g (1)(a) is:
The maximum permissible gradient 10,000 MSL and above is 330 Ft./NM (approximately 3.11°).

Paragraph 2-2-1.g (2) states:

“(2) When a gradient exceeds the maximum DG allowed in paragraph 2-2-1.g (1), the STAR requires approval from Flight Standards. The approval request should state the operational need for the steeper gradient. It is suggested that a study of historical winds for that location be used for analysis and for simulator runs; if the requested steeper descent gradient historically has a head wind (using average historical wind), that information should be included in the approval request.”

The Descent Gradient (388.7817576189191) from WWAVS to EPICK is calculated from a block altitude of 15,000/19,000 at WWAVS to a block altitude of 10,000/15,000 at EPICK, over a distance of 12.85 NM. The course from WWAVS to EPICK is 333.37 magnetic / 347.37 true. When the STAR is in use, a headwind prevails most often.

Due to the proximity of adjacent airports, Class B airspace configuration, and other procedures, there is an operational need to have the SERFR STAR operate along the designed lateral and vertical paths. ATC has determined that it is not operationally acceptable to change the altitude constraints of the STAR at WWAVS and EPICK.

SERFR THREE ARRIVAL (RNAV)

SAN FRANCISCO INTL (SFO)

SAN FRANCISCO, CALIFORNIA

D-ATIS

113.7 115.8 118.85

OAKLAND CENTER

134,55 290,5

NORCAL APP CON

128.575 254.25

SAN FRANCISCO TOWER

120.5 269.1

GND CON

121.8

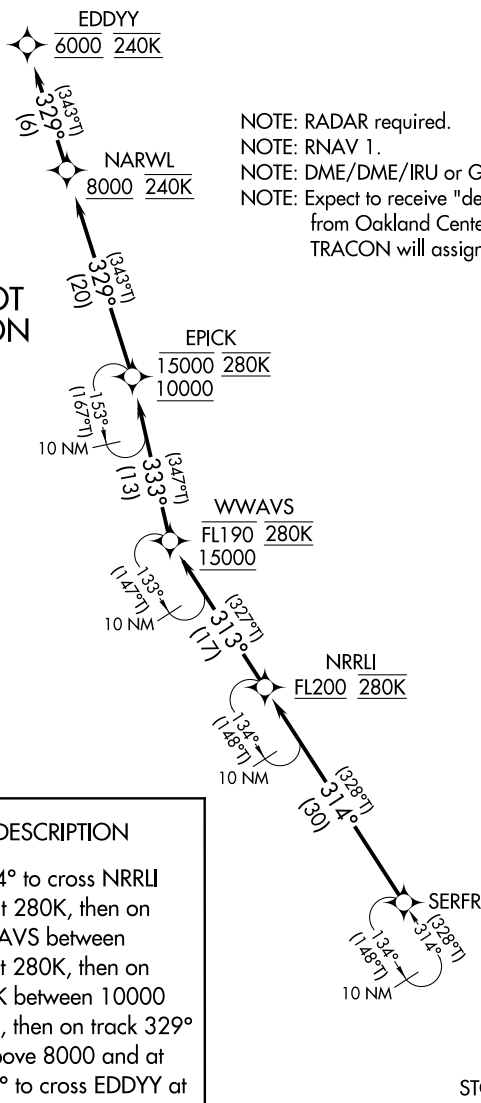
NOTE: RADAR required.

NOTE: RNAV 1.

NOTE: DME/DME/IRU or GPS required.

NOTE: Expect to receive "descend via" clearance from Oakland Center. Northern California TRACON will assign landing runway.

PROTOTYPE: NOT
FOR NAVIGATION



ARRIVAL ROUTE DESCRIPTION

From SERFR on track 314° to cross NRRU at or above FL200 and at 280K, then on track 313° to cross WWAVS between 15000 and FL190 and at 280K, then on track 333° to cross EPICK between 10000 and 15000 and at 280K, then on track 329° to cross NARWL at or above 8000 and at 240K, then on track 329° to cross EDDYY at 6000 and at 240K. Expect assigned instrument approach (Rwy28L/R).

MAKRS Δ STOKD 

NOTE: Chart not to scale.

SERFR THREE ARRIVAL (RNAV)

(SERFR.SERFR3) FIG

SAN FRANCISCO, CALIFORNIA
SAN FRANCISCO INTL (SFO)

(SERFR.SERFR2) 17173

SERFR TWO ARRIVAL (RNAV)

AL-375 (FAA)

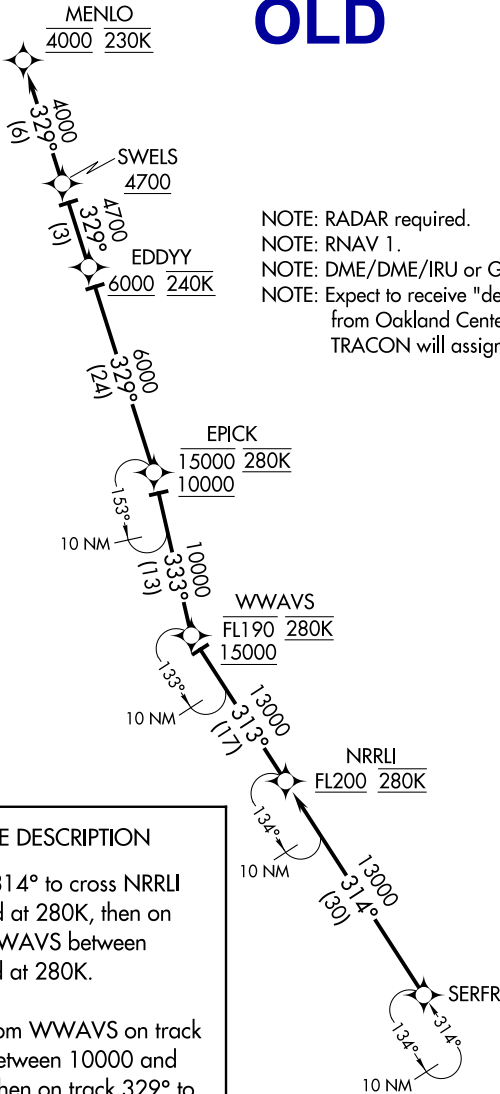
SAN FRANCISCO INTL (SFO)
SAN FRANCISCO, CALIFORNIA



OLD

D-ATIS
113.7 115.8 118.85
OAKLAND CENTER
134.55 290.5
NORCAL APP CON
128.575 254.25
SAN FRANCISCO TOWER
120.5 269.1
GND CON
121.8

NOTE: RADAR required.
NOTE: RNAV 1.
NOTE: DME/DME/IRU or GPS required.
NOTE: Expect to receive "descend via" clearance from Oakland Center. Northern California TRACON will assign landing runway.



ARRIVAL ROUTE DESCRIPTION

From SERFR on track 314° to cross NRRLI at or above FL200 and at 280K, then on track 313° to cross WWAVS between 15000 and FL190 and at 280K.

RUNWAYS 28L/R: From WWAVS on track 333° to cross EPICK between 10000 and 15000 and at 280K, then on track 329° to cross EDDYY at or above 6000 and at 240K, then on track 329° to cross SWELS at or above 4700, then on track 329° to cross MENLO at 4000 and at 230K. Expect assigned instrument approach.

NOTE: Chart not to scale.

SERFR TWO ARRIVAL (RNAV)

(SERFR.SERFR2) 10DEC15

SAN FRANCISCO, CALIFORNIA
SAN FRANCISCO INTL (SFO)

SW-2, 14 SEP 2017 to 12 OCT 2017

SW-2, 14 SEP 2017 to 12 OCT 2017

Bearings, headings, courses, tracks and radials are magnetic. Elevations and altitudes are in feet, MSL. Altitudes are minimum altitudes unless otherwise indicated. Distances are in nautical miles (NM). Graphic depictions attached.

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. Distances are in nautical miles (NM). Graphic depictions attached.

Arrival Name	Number	STAR Computer Code	Superseded Number	Dated	Effective Date
SERFR (RNAV)	THREE	SERFR.SERFR3	TWO	12/10/2015	



Bearings, headings, courses, tracks and radials are magnetic. Elevations and altitudes are in feet, MSL. Altitudes are minimum altitudes unless otherwise indicated. Distances are in nautical miles (NM). Graphic depictions attached.

Bearings, headings, courses, tracks and radials are magnetic. Elevations and altitudes are in feet, MSL. Altitudes are minimum altitudes unless otherwise indicated. Distances are in nautical miles (NM). Graphic depictions attached.

EDDY TERRAIN+AAO (3022)
TP3282_NARWL

NARWL TERRAIN+AAO (3438)
TP3619_EPICK

EPICK TERRAIN+AAO (843)
TP1211_WWAVS

CTC NORCAL APP WITHIN
20 NM ON 105.1 29.1

USE CAUTION
High volume traffic
11,000 to 6000 Licke Int.
to Hollister Airport

NASA FLIGHT TEST
OPERATIONS CONDUCTED
IN THIS AREA BELOW 2500 MSL