

**FEDERAL AVIATION ADMINISTRATION
FLIGHT STANDARDS SERVICE
RNAV (GPS) STANDARD INSTRUMENT APPROACH PROCEDURE
TITLE 14 CFR PART 97.33**

Bearings, headings, courses, tracks 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 feet RVR.

<u>AIRPORT ID</u> 21D	<u>PROCEDURE NAME</u> RNAV (GPS) RWY 32	<u>ORIGINAL/AMENDMENT</u> ORIG	<u>CITY</u> ST PAUL	<u>STATE</u> MN		
<u>AIRPORT ELEVATION</u> 933	<u>TDZE</u> 933	<u>SUPERSEDED</u>	<u>ORIGINAL/AMENDMENT</u> NONE	<u>DATED</u>	<u>MAG VAR</u> 1E	<u>EPOCH YEAR</u> 2010
<u>FACILITY</u> RNAV	<u>COORDINATES OF FACILITIES</u>	<u>ACTUAL EFFECTIVE DATE</u>	<u>REQUIRED EFFECTIVE DATE</u> ROUTINE	<u>CANCEL/SUSPEND</u>		

TERMINAL ROUTES

<u>FROM</u>	<u>FIX TYPE</u>	<u>TO</u>	<u>FIX TYPE</u>	<u>LEG TYPE</u>	<u>FO/FB</u>	<u>RNP</u>	<u>COURSE</u>	<u>DISTANCE</u>	<u>ALTITUDE</u>
ZADAP	IAF	TIMTE	NOPT	TF	FB	1.00	046.43	5.78	3000
MOVDE	IAF	TIMTE	NOPT	TF	FB	1.00	226.84	8.81	3000
TIMTE	IF	ROTIE		TF	FB	1.00	316.72	6.69	2600
ROTIE	FAF	RW32	MAP	TF	FO	0.30	316.65	5.11	
RW32	MAP	1209 MSL		CA			316.65		
1209 MSL		LLIAM		DF	FO	1.00			3000

MISSED APPROACH

MAP:

LPV: DA
LNAV/VNAV: DA
LNAV: RW32

MISSED APPROACH INSTRUCTIONS:

CLIMB TO 3000 DIRECT LLIAM AND HOLD.

ALTERNATE MISSED APPROACH INSTRUCTIONS:



PROFILE:

1. PT

SIDE OF COURSE

OUTBOUND

FT WITHIN

MILES OF

(IAF)

2. HOLD SE TIMTE, RT, 316.72 INBOUND, 3000 FT. IN LIEU OF PT (IAF), MAX 6000.

3. FAC:

316.65

FAF: ROTIE

DIST FAF TO MAP: 5.11

DIST FAF TO THLD: 5.11

4. MIN ALT: TIMTE 3000, ROTIE 2600

5. DIST TO THLD FROM OM:

MM:

IM:

150 HAT:

276 HAT: 0.74

GS ANT:

6. MIN GP INCPT:

2600

GP ALT AT PFAF :

ROTIE 2600

OM:

MM:

IM:

7. GP ANGLE:

3.00

34:1:

IS NOT CLEAR

20:1:

IS CLEAR

TCH:

40.0

8. MSA FROM: RW32 3500

PBN REQUIREMENTS NOTE:

RNP APCH - GPS.

NOTES:

CHART NOTE: RWY 32 HELICOPTER VISIBILITY REDUCTION BELOW 3/4 SM NOT AUTHORIZED.
CHART NOTE: FOR UNCOMPENSATED BARO-VNAV SYSTEMS, LNAV/VNAV NA BELOW -16°C OR ABOVE 54°C.
CHART PROFILE NOTE: VGSI AND RNAV GLIDEPATH NOT COINCIDENT (VGSI ANGLE {ANGLE}/TCH {FEET}).
CHART NOTE: CIRCLING RWY 4, 22 NA AT NIGHT.

ADDITIONAL FLIGHT DATA:

CHART VDP AT 1.19 NM TO RW32.
HOLD NW, RT, 136.46 INBOUND.
CHART FAS OBST: 1133 TRANSMISSION_LINE (27-051615) 445847N/0924900W.
WAAS CHANNEL # 97445
REFERENCE PATH ID: W32A
LTP HAE: 256.1 M

MINIMUMS:

TAKEOFF: SEE FAA FORM 8260-15A FOR THIS AIRPORT

ALTERNATE: NA ☐ STANDARD - NA WHEN LOCAL WEATHER NOT AVAILABLE.

CATEGORY:	A			B			C			D			E		
FINAL TYPE	DA/MDA	VIS	HAT/HAA	DA/MDA	VIS	HAT/HAA	DA/MDA	VIS	HAT/HAA	DA/MDA	VIS	HAT/HAA	DA/MDA	VIS	HAT/HAA
LPV DA	1209	1	276	1209	1	276		NA			NA				
LNAV/VNAV DA	1404	1 3/8	471	1404	1 3/8	471		NA			NA				
LNAV MDA	1400	1	467	1400	1	467		NA			NA				
CIRCLING	1440	1	507	1500	1	567		NA			NA				

CHANGES - REASONS

ORIGINAL



AIRPORT ID
21D

PROCEDURE NAME
RNAV (GPS) RWY 32

ORIGINAL/AMENDMENT
ORIG

CITY
ST PAUL

STATE
MN

COORDINATED WITH:

A4A ☐ **ALPA** ☒ **AOPA** ☒ **APA** ☐ **HAI** ☐ **NBAA** ☒ **OTHER:** ZMP, MSP APP CON, AMGR

FLIGHT CHECKED BY

GLEN B FREEMAN

Digitally signed by
CASIMIR L TABAKA

OFFICE

FPO

DATE

08/15/2023

DEVELOPED BY

CASEY HILL

Digitally signed by

CASEY D HILL

Jun 15, 2023

Aug 17, 2023

OFFICE

AJV-A432

DATE

04/26/2023

APPROVED BY

CASIMIR TABAKA

Digitally signed by
CASIMIR L TABAKA

Jun 16, 2023

OFFICE

AJV-A432

DATE

10/05/2023

TITLE

MANAGER

FAS DATA BLOCK INFORMATION

<u>DATA FIELD</u>	<u>DATA</u>
OPERATION TYPE	0
SBAS SERVICE PROVIDER IDENTIFIER	0
AIRPORT IDENTIFIER	21D
RUNWAY	RW32
APPROACH PERFORMANCE DESIGNATOR	0
ROUTE INDICATOR	
REFERENCE PATH DATA SELECTOR	0
REFERENCE PATH IDENTIFIER (APPROACH ID)	W32A
LTP/FTP LATITUDE	445934.0670N
LTP/FTP LONGITUDE	0925055.9830W
LTP/FTP ELLIPSOIDAL HEIGHT	+02561
FPAP LATITUDE	450039.8390N
FPAP LONGITUDE	0925220.6835W
THRESHOLD CROSSING HEIGHT (TCH)	00040.0
TCH UNITS SELECTOR (METERS OR FEET USED)	F
GLIDEPATH ANGLE (GPA)	03.00
COURSE WIDTH AT THRESHOLD	106.75
LENGTH OFFSET	1680
HORIZONTAL ALERT LIMIT (HAL)	40.0
VERTICAL ALERT LIMIT (VAL)	50.0
CRC REMAINDER	CEAE8323

ADDITIONAL PATH POINT RECORD INFORMATION

ICAO CODE	K3
LTP ORTHOMETRIC HEIGHT	+02842
FPAP ORTHOMETRIC HEIGHT	+02842

FEDERAL AVIATION ADMINISTRATION
FLIGHT STANDARDS SERVICE
STANDARD INSTRUMENT APPROACH PROCEDURE DATA RECORD

<u>AIRPORT ID</u>	<u>PROCEDURE NAME</u>	<u>AMDT NO.</u>	<u>CITY</u>	<u>STATE</u>	<u>AIRPORT ELEVATION</u>	<u>FACILITY</u>
21D	RNAV (GPS) RWY 32	ORIG	ST PAUL	MN	933	RNAV

PART A: OBSTRUCTION DATA SEGMENTS

INITIAL

FROM
ZADAP

TO
TIMTE

<u>RNP</u>	<u>DISTANCE</u>	<u>PAT</u>	<u>MAP</u>	<u>HAT</u>	<u>HMAS</u>							<u>OBSTRUCTION</u>	<u>COORDINATES</u>	<u>ELEV MSL</u>	<u>HORZ</u>	<u>VERT</u>	<u>AC</u>	<u>ROC</u>	<u>OCS</u>	<u>CG</u>	<u>CGTA</u>	<u>ADJUSTMENTS</u>	<u>MIN ALT</u>
	5.78											AAO	444757.00N/0924103.00W	1332	164	98	4E	1000				AT668	3000
												TERRAIN	444757.00N/0924103.00W	1131 (1100)								AS1500	2600

COMPUTATIONS

ALT KIAS KTAS HAA VKTW TR BA DTA COURSE CHANGE DVEB VEB OCS RF CENTER FIX/DISTANCE

SEGMENT REMARKS:

INITIAL

FROM
MOVDE

TO
TIMTE

<u>RNP</u>	<u>DISTANCE</u>	<u>PAT</u>	<u>MAP</u>	<u>HAT</u>	<u>HMAS</u>							<u>OBSTRUCTION</u>	<u>COORDINATES</u>	<u>ELEV MSL</u>	<u>HORZ</u>	<u>VERT</u>	<u>AC</u>	<u>ROC</u>	<u>OCS</u>	<u>CG</u>	<u>CGTA</u>	<u>ADJUSTMENTS</u>	<u>MIN ALT</u>
	8.81											AAO	445706.00N/0923315.00W	1388	164	98	4E	1000				AT612	3000
												TERRAIN	445709.00N/0923330.00W	1187 (1200)								AS1500	2700

COMPUTATIONS

ALT KIAS KTAS HAA VKTW TR BA DTA COURSE CHANGE DVEB VEB OCS RF CENTER FIX/DISTANCE

SEGMENT REMARKS:



INTERMEDIATE

FROM
TIMTE

TO
ROTIE

RNP	DISTANCE	PAT	MAP	HAT			HMAS					
	6.69											
OBSTRUCTION	COORDINATES		ELEV MSL	HORZ	VERT	AC	ROC	OCS	CG	CGTA	ADJUSTMENTS	MIN ALT
TOWER (55-000383)	445410.00N/0924123.80W		1425	250	50	4D	500					2000
TERRAIN	444903.00N/0924003.00W		1118 (1100)								AS1500	2600

COMPUTATIONS

ALT

KIAS

KTAS

HAA

VKTW

TR

BA

DTA

COURSE CHANGE

DVEB

VEB OCS

RF CENTER FIX/DISTANCE

SEGMENT REMARKS:

FINAL: LPV

FROM
ROTIE

TO
DA

<u>RNP</u>	<u>DISTANCE</u> 5.11	<u>PAT</u>	<u>MAP</u> DA	<u>HAT</u> 276			<u>HMAS</u>					
<u>OBSTRUCTION</u>	<u>COORDINATES</u>		<u>ELEV MSL</u>	<u>HORZ</u>	<u>VERT</u>	<u>AC</u>	<u>ROC</u>	<u>OCS</u>	<u>CG</u>	<u>CGTA</u>	<u>ADJUSTMENTS</u>	<u>MIN ALT</u>
TREE (27-094068)	445912.77N/0925027.21W		1012	20	3	1A		34.00:1			MA26	1209

COMPUTATIONS

ALT

KIAS

KTAS

HAA

VKTW

TR

BA

DTA

COURSE CHANGE

DVEB

VEB OCS

RF CENTER FIX/DISTANCE

SEGMENT REMARKS:



FINAL: LNAV/VNAV

FROM
ROTIE

TO
DA

RNP	DISTANCE	PAT	MAP	HAT			HMAS					
	5.11		DA		471							
OBSTRUCTION	COORDINATES		ELEV MSL	HORZ	VERT	AC	ROC	OCS	CG	CGTA	ADJUSTMENTS	MIN ALT
TREE (27-094087)	445859.20N/0924923.56W		1113	20	3	1A		23.35:1				1404

COMPUTATIONS

ALT

KIAS

KTAS

HAA

VKTW

TR

BA

DTA

COURSE CHANGE

DVEB

VEB OCS

RF CENTER FIX/DISTANCE

SEGMENT REMARKS:

FINAL: LNAV

FROM
ROTIE

TO
RW32

RNP	DISTANCE	PAT	MAP	HAT			HMAS					
	5.11		RW32		467							
OBSTRUCTION	COORDINATES		ELEV MSL	HORZ	VERT	AC	ROC	OCS	CG	CGTA	ADJUSTMENTS	MIN ALT
TRANSMISSION_LINE (27-051615)	445847.12N/0924859.80W		1133	20	3	1A	250					1400

COMPUTATIONS

ALT

KIAS

KTAS

HAA

VKTW

TR

BA

DTA

COURSE CHANGE

DVEB

VEB OCS

RF CENTER FIX/DISTANCE

SEGMENT REMARKS:



HOLD-IN-LIEU OF PT

FROM
TIMTE

TO
P-5

RNP	DISTANCE	PAT P-5	MAP	HAT			HMAS					
OBSTRUCTION	COORDINATES		ELEV MSL	HORZ	VERT	AC	ROC	OCS	CG	CGTA	ADJUSTMENTS	MIN ALT
TOWER (55-001228)	444501.00N/0923021.00W		1550	500	125	5E	1000				AT450	3000
TERRAIN	444948.00N/0922803.00W		1259 (1300)								AS1500	2800

COMPUTATIONS

ALT

KIAS

KTAS

HAA

VKTW

TR

BA

DTA

COURSE CHANGE

DVEB

VEB OCS

RF CENTER FIX/DISTANCE

SEGMENT REMARKS:

MISSED APPROACH : LPV

FROM
DA

TO
LLIAM

<u>RNP</u>	<u>DISTANCE</u>	<u>PAT</u>	<u>MAP</u>	<u>HAT</u>			<u>HMAS</u> 1010					
<u>OBSTRUCTION</u>	<u>COORDINATES</u>		<u>ELEV MSL</u>	<u>HORZ</u>	<u>VERT</u>	<u>AC</u>	<u>ROC</u>	<u>OCS</u>	<u>CG</u>	<u>CGTA</u>	<u>ADJUSTMENTS</u>	<u>MIN ALT</u>
TREE (27-094068)	445912.77N/0925027.21W		1012	20	3	1A		ASC				3000
AAO	450245.00N/0925521.00W		1277	164	98	4E	1000					2300
TERRAIN	450245.00N/0925521.00W		1076 (1100)								AS1500	2600

COMPUTATIONS

ALT

KIAS

KTAS

HAA

VKTW

TR

BA

DTA

COURSE CHANGE

DVEB

VEB OCS

RF CENTER FIX/DISTANCE

SEGMENT REMARKS:



MISSED APPROACH : LNAV/VNAV

FROM

DA

TO

LLIAM

RNP	DISTANCE	PAT	MAP	HAT			HMAS 1262					
OBSTRUCTION	COORDINATES		ELEV MSL	HORZ	VERT	AC	ROC	OCS	CG	CGTA	ADJUSTMENTS	MIN ALT
								ASC				3000
AAO	450245.00N/0925521.00W		1277	164	98	4E	1000					2300
TERRAIN	450245.00N/0925521.00W		1076 (1100)								AS1500	2600

COMPUTATIONS	ALT	KIAS	KTAS	HAA	VKTW	TR	BA	DTA	COURSE CHANGE	DVEB	VEB OCS	RF CENTER FIX/DISTANCE
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SEGMENT REMARKS:

MISSED APPROACH : LNAV

FROM

RW32

TO

LLIAM

RNP	DISTANCE	PAT	MAP	HAT			HMAS 1300					
OBSTRUCTION	COORDINATES		ELEV MSL	HORZ	VERT	AC	ROC	OCS	CG	CGTA	ADJUSTMENTS	MIN ALT
								ASC				3000
AAO	450245.00N/0925521.00W		1277	164	98	4E	1000					2300
TERRAIN	450245.00N/0925521.00W		1076 (1100)								AS1500	2600

COMPUTATIONS	ALT	KIAS	KTAS	HAA	VKTW	TR	BA	DTA	COURSE CHANGE	DVEB	VEB OCS	RF CENTER FIX/DISTANCE
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SEGMENT REMARKS:



CIRCLING

☐ ALL CATS

☒ CAT A

☒ CAT B

☐ CAT C

☐ CAT D

☐ CAT E

☐ NOT AUTHORIZED

OBSTRUCTION	COORDINATES	RADIUS	HAA	ELEV MSL	HORZ	VERT	AC	ROC	OCS	ADJUSTMENTS	MIN ALT
CATEGORY A											
TREE (27-094235)	445929.10N/0924911.74W	1.30	507	1123	20	10	1B	300			1440
CATEGORY B											
TRANSMISSION_LINE (27-050499)	450013.25N/0924900.15W	1.84	567	1181	20	10	1B	300			1500

CIRCLING REMARKS:

MSA

CENTER

RW32

RADIUS

25

SECTOR	OBSTRUCTION	COORDINATES	BEARING	DISTANCE	ELEV MSL	HORZ	VERT	AC	ROC	OCS	ADJUSTMENTS	MIN ALT
360-360	TOWER (27-000499)	450344.83N/0930822.61W	288	13.1	2438	20	50	1D	1000			3500

MSA REMARKS:

NOTES/EXPLANATIONS FROM PROCEDURE SEGMENTS:

VISIBILITY NO LOWER THAN 1 SM PER ADO.

CAT A&B ONLY PER ADO.

PART B: SUPPLEMENTAL DATA

COMMUNICATIONS WITH
MSP APP CON

<u>WX SERVICE</u> AWOS-3	<u>LOCATION</u> K21D	<u>HRS OPERATION</u> 24	<u>ALTIMETER SOURCE</u> K21D	<u>DISTANCE</u> 0	<u>SERVICE-A</u> Y	<u>ADJUSTMENTS</u> 0
<u>BACK-UP WX SERVICE</u> ASOS	<u>LOCATION</u> KSTP	<u>HRS OPERATION</u> 24	<u>ALTIMETER SOURCE</u> KSTP	<u>DISTANCE</u> 9.50	<u>SERVICE-A</u> Y	<u>ADJUSTMENTS</u> 54

WX REMARKS:
RASS PRESSURE PATTERNS THE SAME
K21D 933, KSTP 705
RA=53.9

<u>PRIMARY NAVAID</u>	<u>MONITOR POINT</u>	<u>HRS OPERATION</u>	<u>CAT</u>
<u>APPROACH AND RUNWAY LIGHTING SYSTEM</u>		<u>RUNWAY MARKINGS</u>	<u>RUNWAY VISUAL RANGE</u>
RW22		BSC-G	
RW04		NPI-G	
RW14 - MIRL (PCL), REIL (PCL), PAPI-4L (PCL)		NPI-G	
RW32 - MIRL (PCL), REIL (PCL), PAPI-4L (PCL)		NPI-G	

<u>GLIDESLOPE ANGLE</u> 3.00	<u>ELEV RWY THRESHOLD</u> 932.5	<u>TCH</u> 40.0	<u>ELEV GS ANTENNA</u>	<u>DISTANCE FROM RWY</u>	<u>VGSI ANGLE</u> 3.50	<u>TCH</u> 24.9
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FINAL APPROACH COURSE AIMING

RUNWAY THRESHOLD	☒	FT FROM THRESHOLD	DISPLACED THRESHOLD DISTANCE
ON CENTERLINE	☒	FT FROM CENTERLINE	

CRITICAL TEMPERATURES

<u>CRITICAL LOW</u> -16C	<u>CRITICAL HIGH</u> +54C	<u>ACT</u> -16C	<u>APT ISA</u> +13.15C
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CRITICAL TEMPERATURE REMARKS:

AVERAGE COLD TEMPERATURE DERIVED FROM STANDARD -30C ISA DEVIATION.
CRITICAL LOW TEMPERATURE BASED ON ACT.
DESCENT RATE (FPM): STANDARD TEMP 718 HIGH TEMP 1138.



"VISUAL PORTION OF FINAL" PENETRATIONS

Final Type	LPV, LNAV/VNAV, AND LNAV		
34:1			
1010 TREE (27-093987) 445916.37N/0925028.72W (5.59)		1011 TREE (27-094471) 445914.19N/0925029.70W (3.2)	
1009 TREE (27-094156) 445916.43N/0925026.59W (1.69)		986 TREE (27-094394) 445921.09N/0925035.20W (1.21)	

HELICOPTER 'VISUAL PORTION OF FINAL' PENETRATIONS

and/or
5280-FT "PROCEED VFR" SEGMENT LEVEL SURFACE AREA PENETRATIONS

PENETRATIONS REMARKS:

PART C: GENERAL REMARKS:

FOR CONTINGENCY PURPOSES: WHEN LOCAL ALTIMETER SETTING NOT RECEIVED, USE ST PAUL DOWNTOWN HOLMAN FLD ALTIMETER SETTING: INCREASE LPV DA TO 1263 FEET; INCREASE LNAV/VNAV DA TO 1458 FEET AND VISIBILITY 1/8 SM; INCREASE ALL MDAS 60 FEET.

BARO-VNAV AND VDP NA WHEN USING ST PAUL DOWNTOWN HOLMAN FLD ALTIMETER SETTING.

PRECIPITOUS TERRAIN EVALUATION COMPLETED.

100FT VEGETATION USED PER FPT.

CIRCLING RWY 4, 20 NA AT NIGHT DUE TO NO RUNWAY LIGHTING.

ORDER 8260.3, CHAPTER 2, NEW CIRCLING CRITERIA APPLIED.



<u>AIRPORT ID</u> 21D	<u>PROCEDURE NAME</u> RNAV (GPS) RWY 32	<u>AMDT NO.</u> ORIG	<u>CITY</u> ST PAUL	<u>STATE</u> MN	<u>AIRPORT ELEVATION</u> 933	<u>FACILITY</u> RNAV
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PART D: AIRSPACE

DOCKET #

ALL DISTANCES TO 1/100NM; ELEVATION TO NEAREST 100 FEET; COORDINATES TO 1/100 SECOND; DEG TO 1/100 DEGREE

DISTANCE FROM	MAP	TO 1000FT POINT	3.23
WIDTH OF	FINAL	SEGMENT AT 1000FT POINT	1.20
TRUE COURSE OF	FINAL	SEGMENT CONTAINING 1000FT POINT	317.65
HIGH TERRAIN IN	FINAL	SEGMENT CONTAINING 1000FT POINT	1000
DISTANCE FROM	MAP	TO 1500FT POINT	4.91
WIDTH OF	FINAL	SEGMENT AT 1500FT POINT	1.95
TRUE COURSE OF	FINAL	SEGMENT CONTAINING 1500FT POINT	317.65
HIGH TERRAIN IN	FINAL	SEGMENT CONTAINING 1500FT POINT	1000

THRESHOLD
COORDINATES
(IF STR-IN)

445934.07N/0925055.98W

ARP COORDINATES

445949.91N/0925113.27W

RUNWAY APCH END
AND DIST FURTHEST
FROM ARP

RUNWAY 32 DISTANCE 0.33 NM

FAF
COORDINATES

445547.58N/0924604.90W

FIX NAME
COORDINATES

REMARKS

NO ADDITIONAL AIRSPACE REQUIRED.

FAA Form 8260-9 / (11/16) Supersedes Previous Edition

Electronic Version

QUALITY
29
CHECKED

Page 9 of 10

PART E: PREPARED BY

<u>NAME</u> CASEY HILL	<u>OFFICE</u> AJV-A432	<u>DATE</u> 04/26/2023	<u>TITLE</u> AERONAUTICAL INFORMATION SPECIALIST
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