

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</u> BOYNE CITY MUNI	<u>AIRPORT ID</u> N98	<u>PROCEDURE NAME</u> RNAV (GPS) RWY 27	<u>ORIGINAL/AMENDMENT</u> ORIG-C	<u>CITY</u> BOYNE CITY	<u>STATE</u> MI	
<u>AIRPORT ELEVATION</u> 660	<u>TDZE</u> 660	<u>SUPERSEDED</u> RNAV (GPS) RWY 27	<u>ORIGINAL/AMENDMENT</u> ORIG-B	<u>DATED</u> 07/23/2015	<u>MAG VAR</u> 5W	<u>EPOCH YEAR</u> 1985
<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>
WOMOP	IF/IAF	UHOZA		TF	FB	1.00	253.93	7.27	2500
UHOZA	FAF	KIYRE/2.70 NM TO RW27		TF	FB	0.30	277.74	2.95	
KIYRE/2.70 NM TO RW27		RW27	MAP	TF	FO	0.30	277.74	2.70	
RW27	MAP	1060 MSL		CA			277.74		
1060 MSL		YOVUG		DF	FB	1.00			
YOVUG		ADENO INT		TF	FO	1.00	218.43	12.95	3000

MISSED APPROACH

MAP:

LP: RW27

LNAV: RW27

MISSED APPROACH INSTRUCTIONS:

CLIMB TO 3000 DIRECT YOYUG AND ON TRACK 218.43 TO ADENO INT AND HOLD.

ALTERNATE MISSED APPROACH INSTRUCTIONS:



PROFILE:

1. PT

SIDE OF COURSE

OUTBOUND

FT WITHIN

MILES OF (IAF)

2. HOLD E WOMOP, RT, 253.93 INBOUND, 3200 FT. IN LIEU OF PT (IAF), MAX 6000.

3. FAC: 277.74 FAF: UHOZA DIST FAF TO MAP: 5.65 DIST FAF TO THLD: 5.65

4. MIN ALT: UHOZA 2500, KIYRE/2.70 NM TO RW27 1540

5. DIST TO THLD FROM OM: MM: IM: 150 HAT: GS ANT: OM: MM: IM:

6. MIN GP INCPT: GP ALT AT FAF :

7. GP ANGLE: 34:1: IS NOT CLEAR 20:1: IS NOT CLEAR TCH:

8. MSA FROM: RW27 3500

PBN REQUIREMENTS NOTE:

RNP APCH.

NOTES:

CHART PLANVIEW NOTE: NOPT FOR ARRIVAL AT WOMOP ON V233 SOUTHBOUND.
CHART NOTE: RWY 27 HELICOPTER VISIBILITY REDUCTION BELOW 1 SM NOT AUTHORIZED.
CHART NOTE: USE CHARLEVOIX ALTIMETER SETTING, WHEN NOT RECEIVED, USE HARBOR SPRINGS ALTIMETER SETTING.

ADDITIONAL FLIGHT DATA:

CHART CHARLEVOIX AWOS-3
CHART PROFILE NOTE: VISUAL SEGMENT - OBSTACLES.
WAAS CHANNEL #50326
REFERENCE PATH ID: W27A
CHART FAS OBST: 1167 TREE 451232N/0845645W.
1397 AAO 451241N/0845051W, 1364 AAO 451255N/0845117W.
HOLD SW, RT, 037.76 INBOUND
LTP HAE: 166 M

MINIMUMS:

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

ALTERNATE: NA ☒

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
LP MDA	1460	1	800	1460	1 1/4	800		NA			NA				
LNAV MDA	1480	1	820	1480	1 1/4	820		NA			NA				
CIRCLING	1480	1 1/4	820	1500	1 1/4	840		NA			NA				



CHANGES - REASONS

1. DELETED DESCENT ANGLE 3.00/TCH 40 AND VGSI NON-COINCIDENT NOTE AND ADDED "VISUAL SEGMENT - OBSTACLES" - VISUAL SEGMENT UNSAT AS PER FC.
2. DELETE DME/DME RNP-0.3 NA AND REPLACED WITH PBN REQUIREMENT NOTE - 8260.58A TABLE 1-2-1.
3. DELETE NOTE: HELICOPTER VISIBILITY REDUCTION BELOW 1 SM NA - REPLACE WITH RWY 27 HELICOPTER VISIBILITY REDUCTION BELOW 1 SM NOT AUTHORIZED.
4. CRC REMAINDER FROM 8F20681C TO BFE08088 - TCH/GP ANGLE CHANGED FROM 3.00/40 TO 0/0.
5. ADDED CHART NOTE: PROCEDURE NA AT NIGHT, DELETED NOTE: WHEN VGSI INOP, PROCEDURE NA AT NIGHT - PER P-NOTAM FOR AMDT ORIG-B, 20:1 PENS.

THIS CXS 8/4058.

1/17/19. THIS IS AN UPDATED COPY OF THE FORM DEVELOPED ON 9/24/18

UPDATED REASON FOR CRC CHANGE IN CHANGE 4, TCH/GP ANGLE CHANGED FROM 3.00/40 TO 0/0.

ADDED CHANGE/REASON 5, ADDED CHART NOTE: PROCEDURE NA AT NIGHT, DELETED NOTE: WHEN VGSI INOP, PROCEDURE NA AT NIGHT - PER P-NOTAM FOR AMDT ORIG-B, 20:1 PENS.

COORDINATED WITH:

A4A ☐ **ALPA** ☒ **AOPA** ☒ **APA** ☐ **HAI** ☐ **NBAA** ☒ **OTHER:** ZMP, AIRPORT MANAGER

FLIGHT CHECKED BY

JEFFREY WAYNE HARING

OFFICE

FIOG

DATE

01/10/2019

Digitally signed by

ALLAN WILL

Jan 17, 2019

DEVELOPED BY

PHILLIP BRANDENBURG

Digitally signed by

PHILLIP BRANDENBURG

Jan 17, 2019

OFFICE

AJV-5423

DATE

09/24/2018

Digitally signed by

ALLAN WILL

Jan 17, 2019

APPROVED BY

JULIE MORGAN

OFFICE

AJV-5420

DATE**TITLE**

MANAGER

FAS DATA BLOCK INFORMATION

<u>DATA FIELD</u>	<u>DATA</u>
OPERATION TYPE	0
SBAS SERVICE PROVIDER IDENTIFIER	0
AIRPORT IDENTIFIER	N98
RUNWAY	RW27
APPROACH PERFORMANCE DESIGNATOR	0
ROUTE INDICATOR	
REFERENCE PATH DATA SELECTOR	0
REFERENCE PATH IDENTIFIER (APPROACH ID)	W27A
LTP/FTP LATITUDE	451230.8165N
LTP/FTP LONGITUDE	0845855.6735W
LTP/FTP ELLIPSOIDAL HEIGHT	+01660
FPAP LATITUDE	451234.9200N
FPAP LONGITUDE	0850101.5700W
THRESHOLD CROSSING HEIGHT (TCH)	00000.0
TCH UNITS SELECTOR (METERS OR FEET USED)	F
GLIDEPATH ANGLE (GPA)	00.00
COURSE WIDTH AT THRESHOLD	106.75
LENGTH OFFSET	1528
HORIZONTAL ALERT LIMIT (HAL)	40.0
VERTICAL ALERT LIMIT (VAL)	0.0
CRC REMAINDER	BFE08088

ADDITIONAL PATH POINT RECORD INFORMATION

ICAO CODE	K5
LTP ORTHOMETRIC HEIGHT	+02010
FPAP ORTHOMETRIC HEIGHT	+02010



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

<u>AIRPORT</u> BOYNE CITY MUNI	<u>AIRPORT ID</u> N98	<u>PROCEDURE NAME</u> RNAV (GPS) RWY 27	<u>AMDT NO.</u> ORIG-C	<u>CITY</u> BOYNE CITY	<u>STATE</u> MI	<u>AIRPORT ELEVATION</u> 660	<u>FACILITY</u> RNAV
-----------------------------------	--------------------------	--	---------------------------	---------------------------	--------------------	---------------------------------	-------------------------

PART A: OBSTRUCTION DATA SEGMENTS

INTERMEDIATE

<u>FROM</u> WOMOP (IF/IAF)	<u>TO</u> UHOZA
-------------------------------	--------------------

<u>RNP</u>	<u>DISTANCE</u> 7.27	<u>PAT</u>	<u>MAP</u>	<u>HAT</u>	<u>HMAS</u>
------------	-------------------------	------------	------------	------------	-------------

OBSTRUCTION	COORDINATES	ELEV MSL	HORZ	VERT	AC	ROC	OCS	CG	CGTA	ADJUSTMENTS	MIN ALT
1.AAO	451228.00N/0844636.00W	1545	50	20	2C	500				AT455	2500
2.TERRAIN	451228.00N/0844636.00W	1345 (1300)								AS1000	2300

COMPUTATIONS

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

SEGMENT REMARKS:

FINAL: LP

<u>FROM</u> UHOZA	<u>TO</u> KIYRE/2.70 NM TO RW27
----------------------	------------------------------------

<u>RNP</u>	<u>DISTANCE</u> 2.95	<u>PAT</u>	<u>MAP</u>	<u>HAT</u>	<u>HMAS</u>
------------	-------------------------	------------	------------	------------	-------------

OBSTRUCTION	COORDINATES	ELEV MSL	HORZ	VERT	AC	ROC	OCS	CG	CGTA	ADJUSTMENTS	MIN ALT
3.AAO	451238.00N/0845403.00W	1200	50	20	2C	250				RA35 DG55	1540

COMPUTATIONS

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

SEGMENT REMARKS:



HOLD-IN-LIEU OF PT

FROM
WOMOP

TO
P-5

<u>RNP</u>	<u>DISTANCE</u>	<u>PAT</u> P-5	<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>
1.AAO	451228.00N/0844636.00W		1545	50	20	2C	1000				AT655	3200
2.TERRAIN	451228.00N/0844636.00W		1345 (1300)	50	20	2C					AS1500	2800

<u>COMPUTATIONS</u>	<u>ALT</u>	<u>KIAS</u>	<u>KTAS</u>	<u>HAA</u>	<u>VKTW</u>	<u>TR</u>	<u>BA</u>	<u>DTA</u>	<u>COURSE CHANGE</u>	<u>DVEB</u>	<u>VEB OCS</u>	<u>RF CENTER FIX/DISTANCE</u>
---------------------	------------	-------------	-------------	------------	-------------	-----------	-----------	------------	----------------------	-------------	----------------	-------------------------------

SEGMENT REMARKS:

MISSED APPROACH : LP

FROM
RW27

TO
ADENO INT

<u>RNP</u>	<u>DISTANCE</u>	<u>PAT</u>	<u>MAP</u>	<u>HAT</u>			<u>HMAS</u> 1325					
<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>
								ASC				3000
6.TOWER (26-001068)	451049.00N/0850550.20W		1676	50	20	2C	1000					2700
7.TERRAIN	450951.00N/0850515.00W		1132 (1100)								AS1500	2600

<u>COMPUTATIONS</u>	<u>ALT</u>	<u>KIAS</u>	<u>KTAS</u>	<u>HAA</u>	<u>VKTW</u>	<u>TR</u>	<u>BA</u>	<u>DTA</u>	<u>COURSE CHANGE</u>	<u>DVEB</u>	<u>VEB OCS</u>	<u>RF CENTER FIX/DISTANCE</u>
---------------------	------------	-------------	-------------	------------	-------------	-----------	-----------	------------	----------------------	-------------	----------------	-------------------------------

SEGMENT REMARKS:



KN98, KCVX, AND KMGN PRESSURE PATTERNS SAME
KN98 660, KMGN 686, KCVX 669
KMGN RA=34.46
KCVX RA = 32.08
KCVX AND KMGN ARE SAME DISTANCE FROM KN98. THE GREATER ADJUSTMENT (35 FEET) WAS APPLIED FOR BOTH LOCATIONS

DTED NOT USED IN FINAL, CIRCLING, AND MISSED APPROACH DUE TO REQUIRED ACCURACY ADJUSTMENT. AAO AND TREE OBSTACLES WERE DERIVED FROM 1:24/25 TOPO CHART, BY THE NEXT HIGHER METRIC CONTOUR, MINUS ONE FOOT METHOD

TERPS PARAGRAPH 289 APPLIED TO 1397 AAO 451241N/0845051W AND 1364 AAO 451255N/0845117W

KCVX AND KMGN AWOS ON SERVICE-A

TREE HEIGHT 100'.



"VISUAL PORTION OF FINAL" PENETRATIONS

Final Type	LNAV
20:1	
1027 TREE (KN98T1816) 451234.87N/0845731.18W (76.65)	1141 TREE (KN98T2240) 451240.99N/0845656.77W (69.10)
1147 TREE (KN98T2283) 451240.87N/0845653.98W (65.10)	985 TREE (KN98T1640) 451236.84N/0845739.43W (64.60)
THE TOP FOUR PENETRATIONS ARE LISTED HERE. THE ENTIRE LIST OF PENETRATORS IS VERY EXTENSIVE AND HAS BEEN SUBMITTED AS SUPPORTING DATA. IT WILL BE FILED ALONG WITH PROCEDURE FORMS AND CORRESPONDENCE.	
Final Type	LNAV
34:1	
1167 TREE (KN98T2393) 451231.95N/0845645.05W (239.09)	1149 TREE (KN98T2309) 451240.32N/0845651.68W (236.20)
1161 TREE (KN98T2384) 451233.48N/0845645.97W (235.24)	1163 TREE (KN98T2403) 451230.99N/0845644.36W (233.51)
THE TOP FOUR PENETRATIONS ARE LISTED HERE. THE ENTIRE LIST OF PENETRATORS IS VERY EXTENSIVE AND HAS BEEN SUBMITTED AS SUPPORTING DATA. IT WILL BE FILED ALONG WITH PROCEDURE FORMS AND CORRESPONDENCE.	

HELICOPTER 'VISUAL PORTION OF FINAL' PENETRATIONS

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

PART C: GENERAL REMARKS:
VDP NOT ESTABLISHED - FULL TIME REMOTE ALTIMETER.
PRECIPITOUS TERRAIN EVALUATION COMPLETED.
UHOZA TO RW27: 3.00/40.



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	THLD	TO 1000FT POINT	4.65
WIDTH OF	FINAL	SEGMENT AT 1000FT POINT	1.20
TRUE COURSE OF	FINAL	SEGMENT CONTAINING 1000FT POINT	272.74
HIGH TERRAIN IN	FINAL	SEGMENT CONTAINING 1000FT POINT	1200
DISTANCE FROM	FAF	TO 1500FT POINT	6.47
WIDTH OF	INTERMEDIATE	SEGMENT AT 1500FT POINT	4.00
TRUE COURSE OF	INTERMEDIATE	SEGMENT CONTAINING 1500FT POINT	248.93
HIGH TERRAIN IN	INTERMEDIATE	SEGMENT CONTAINING 1500FT POINT	1300

THRESHOLD
COORDINATES
(IF STR-IN)

451230.82N/0845855.67W

ARP COORDINATES

451231.73N/0845923.59W

RUNWAY APCH END
AND DIST FURTHEST
FROM ARP

RUNWAY 27 DISTANCE 0.33 NM

FAF
COORDINATES

451214.86N/0845056.34W

FIX NAME
COORDINATES

REMARKS

NO ADDITIONAL AIRSPACE REQUIRED.



