

Very High Frequency Omnidirectional Range (VOR) Minimum Operational Network (MON)

Program Update

Presented at: Aeronautical Charting Meeting (ACM)

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Date: October 26, 2021



Federal Aviation
Administration



Agenda

- Operational Plan
- Timeline
- Candidate Discontinuance VORs & MON Airports
- Program Accomplishments
- Planned Activities
- Two New VOR Standard Service Volumes
- Next Steps



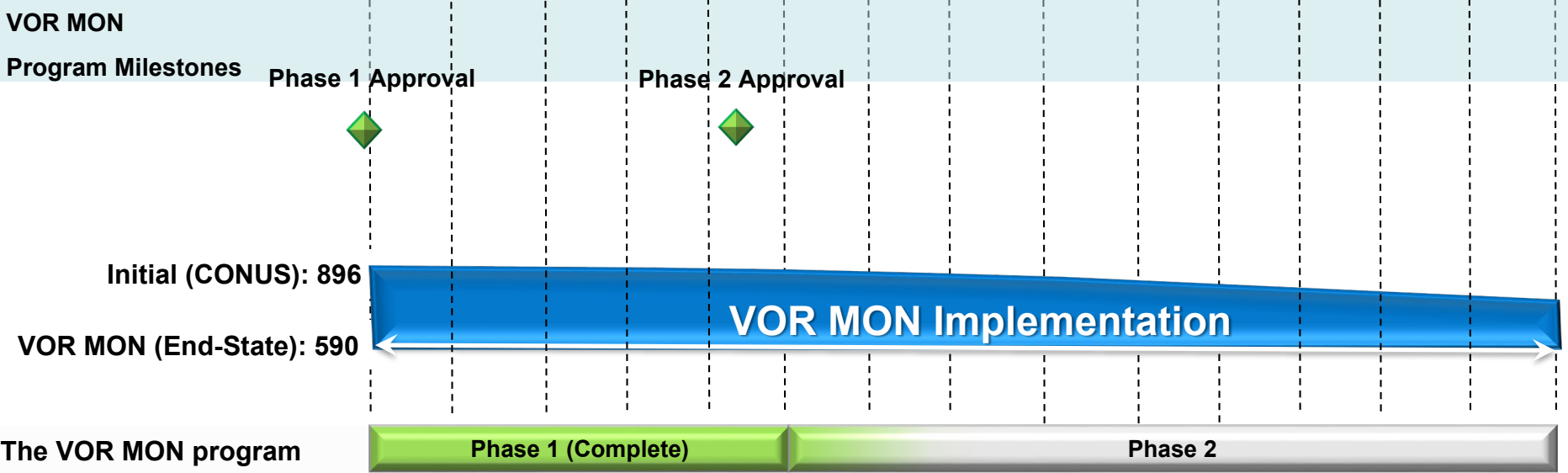
Operational Plan

- Support the National Airspace System (NAS) transition from VOR navigation to Performance Based Navigation (PBN) consistent with NAS modernization goals.
- Within the contiguous 48 states (CONUS), the VOR MON will enable pilots to:
 - Revert from PBN to conventional navigation in the event of an unplanned Global Positioning System (GPS) outage;
 - Tune and identify a VOR at and above 5,000 feet Above Ground Level (AGL);
 - Coverage will exist but may not be continuous at lower altitudes
 - Navigate VOR-to-VOR or along airways through the outage;
 - Navigate to a MON airport within 100 nautical miles to fly a Localizer (LOC), Instrument Landing System (ILS) or VOR instrument approach without Distance Measuring Equipment (DME), Automatic Direction Finder (ADF), surveillance, or GPS where the capability currently exists; and
 - Navigate along VOR Airways, especially in western mountainous terrain where surveillance services are impracticable and Minimum En Route Altitudes (MEAs) offer lower altitude options in icing conditions.
- Discontinue approximately 34% (306) of VORs in the CONUS by FY30
 - The discontinuance process is governed by FAA Order 7400.2 *Procedures for Handling Airspace Matters*.



Timeline

FY16 FY17 FY18 FY19 FY20 FY21 FY22 FY23 FY24 FY25 FY26 FY27 FY28 FY29 FY30



Initial (CONUS): 896

VOR MON (End-State): 590

VOR MON Implementation

Phase 1 (Complete)

Phase 2

The VOR MON program will be completed in 2 Phases:

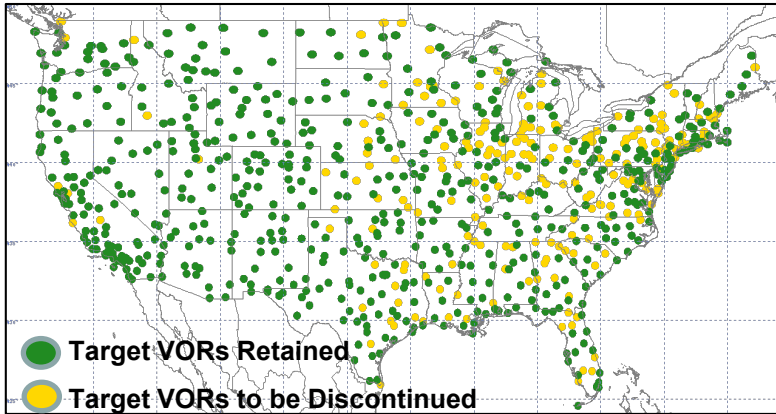
Phase 1: FY16 – FY20

Phase 2: FY21 – FY30

- Published Final Policy FRN: *“Provision of Navigation Services for the Next Generation Air Transportation System (NextGen) Transition to Performance Based Navigation (PBN) - 07/26/2016*
- Removed, Replaced, Amended affected Instrument Flight Procedures (IFPs)
- Discontinued 82 VORs
- Received Phase 2 Program Approval - 03/18/2020
- Continue IFP work
- Plan to discontinue approximately 224 VORs
 - As of 10/7/2021, discontinued 31 VORs



Candidate Discontinuance VORs & MON Airports

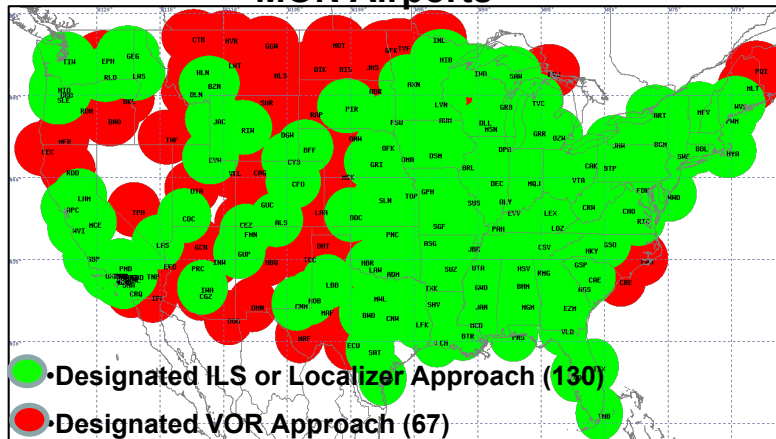


● Retained VORs (590)

● Candidate Discontinuance VORs (306)

Candidate Discontinuance VORs	
Service Area	VOR #
Western	17
Central	181
Eastern	108
Total	306

MON Airports



The circles depict 100 nm around the MON airports. MON airports ensure that an aircraft is within 100 nm of a location where an LOC, ILS or VOR approach may be flown, where the capability currently exists.

VOR Configurations (as of October 10, 2021)				
	Retention #	Discontinuance (Remaining) #	Current Total	Total Discontinued
VOR	16	6	22	7
VOR/DME	215	91	306	69
VORTAC	359	96	455	37
Total	590	193	783	113

Program Accomplishments

- **16 VOR discontinuances since the last ACM:**

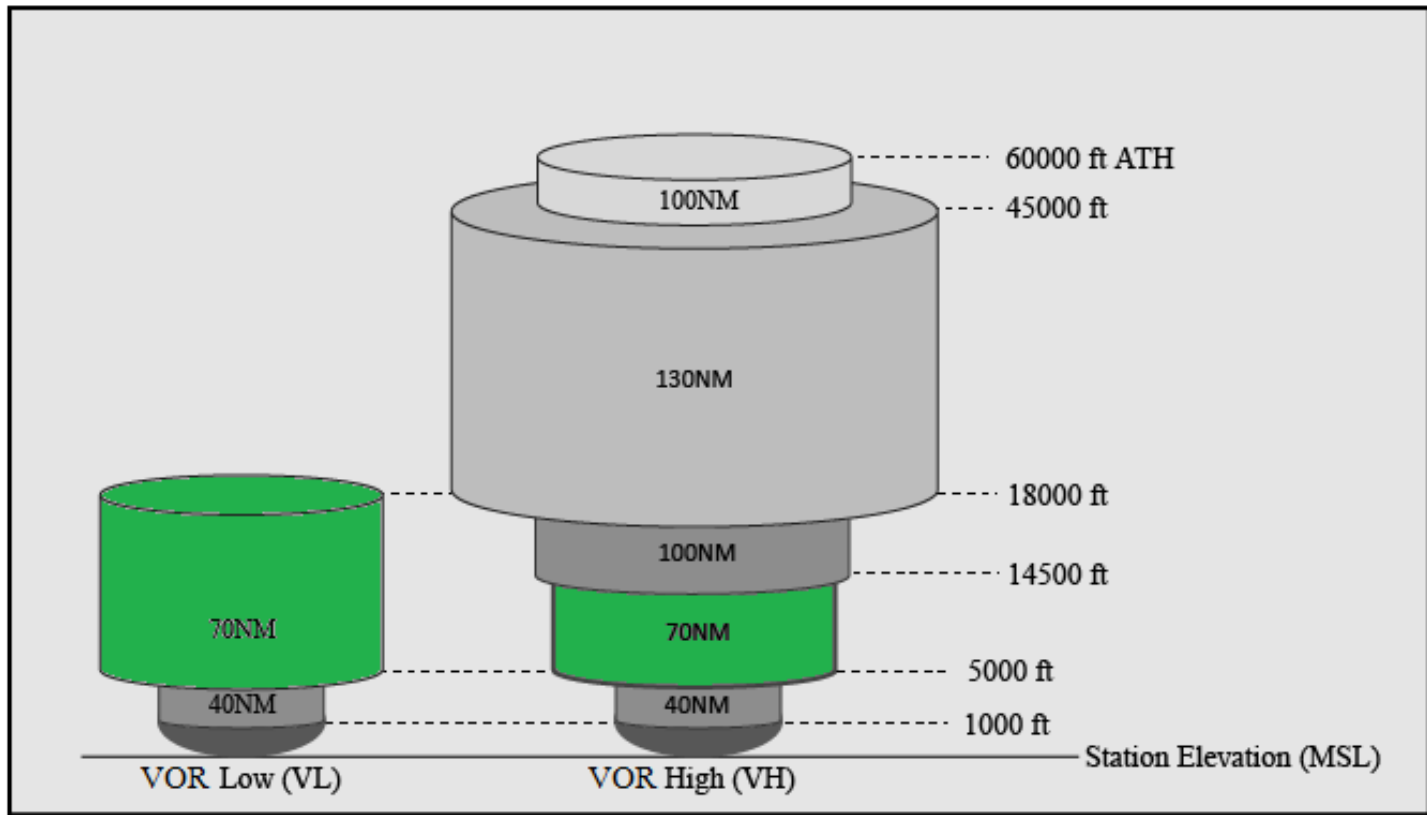
98. (HNN) Henderson, WV – June 17, 2021
99. (LEB) Lebanon, NH – June 17, 2021
100. (LWM) Lawrence, MA – June 17, 2021
101. (MSS) Massena, NY – June 17, 2021
102. (MWA) Marion, IL – June 17, 2021
103. (SLK) Saranac Lake, NY – June 17, 2021
104. (DCU) Decatur, AL – August 12, 2021
105. (GBG) Galesburg, IL – August 12, 2021
106. (MAP) Maples, MO – August 12, 2021
107. (STS) Santa Rosa, CA – August 12, 2021
108. (UCA) Utica, NY – August 12, 2021
109. (VQQ) Jacksonville, FL – August 12, 2021
110. (EEN) Keene, NH – October 7, 2021
111. (HUL) Houlton, ME – October 7, 2021
112. (MCM) Macon, MO – October 7, 2021
113. (RFD) Rockford, IL – October 7, 2021

Planned Activities

- Discontinue four (4) VORs – **December 2, 2021:**
 1. (GGT) Georgetown, NY
 2. (HML) Lebanon, NH
 3. (MBL) Manistee, MI
 4. (PSM) Portsmouth, NH
- Discontinue two (2) VORs – **January 27, 2022:**
 1. (BUF) Buffalo, NY
 2. (EOS) Neosho, MO
- Discontinue four (4) VORs – **March 24, 2022:**
 1. (ERI) Erie, PA
 2. (JFN) Jefferson, OH
 3. (OTG) Worthington, MN
 4. (VIS) Visalia, CA



Two New VOR Standard Service Volumes



Mean Sea level (MSL)
Above Transmitter Height (ATH)

Two New VOR Standard Service Volumes cont'd

- The VORs that are in the MON are transitioning to new Service Volumes
- As the new Service Volumes are certified they will be uploaded into the FAA National Airspace System Resource (NASR) database
 - Initiate publication of five (5) new VOR Standard Service Volumes on December 2, 2021
 - (GCN) Grand Canyon, AZ
 - (AUG) August, ME
 - (ABI) Abilene, TX
 - (BGR) Bangor, ME
 - (ABQ) Albuquerque, NM
 - Plan on publishing approximately 25 new VOR Standard Service Volumes per Chart Cycle

Next Steps

- Continue the following activities to establish the VOR MON and support VOR discontinuances:
 - Flight inspection of MON VORs in order to implement new SSVs
 - Mitigation of Instrument Flight Procedures (IFPs) due to VOR discontinuances

Contact the VOR MON Program

- Public Website – www.faa.gov/go/VORMON
- Public Voicemail – (844) VORMON / (844) 486-7666
- Public Email – VORMON@faa.gov



Questions



Backup



Program Accomplishments

113 VORs discontinued to date (cumulative for Phase 1 and Phase 2):

1. (EDS) Edisto, in Orangeburg, SC – February 4, 2016
2. (BUA) Buffalo, in Buffalo, SD – July 21, 2016
3. (PNN) Princeton, in Princeton ME – July 21, 2016
4. (PLB) Plattsburgh, in Plattsburgh, NY – September 15, 2016
5. (AOH) Allen County, in Lima, OH – September 15, 2016
6. (ABB) Nabb in Nabb, IN – January 5, 2017
7. (SYO) Sayre in Sayre, OK – April 27, 2017
8. (ENW) Kenosha in Kenosha, WI – June 22, 2017
9. (BTL) Battle Creek in Battle Creek, MI – June 22, 2017
10. (HRK] Horlick in Racine, WI – June 22, 2017
11. (HUW) Hutton in West Plains, MO – August 17, 2017
12. (RIS) Riverside in Kansas City, MO – September 14, 2017
13. (DDD) Port City, in Muscatine, IA – October 12, 2017
14. (JKS) Jacks Creek, in Jacks Creek, TN – October 12, 2017
15. (MXW) Maxwell, in Maxwell, Ca – October 12, 2017
16. (STE) Stevens Point in Stevens Point, WI – October 12, 2017
17. (GHM) Graham in Centerville, TN – December 7, 2017
18. (DKK) Dunkirk in Dunkirk, NY – December 7, 2017
19. (DUC) Duncan in Duncan, OK – February 1, 2018
20. (AOO) Altoona in Altoona, PA – March 29, 2018



Program Accomplishments cont'd

21. (MMJ) Montour in Pittsburg, PA – March 29, 2018
22. (HZL) Hazleton in Hazelton, PA – March 29, 2018
23. (ECA) Manteca in Stockton, CA – March 29, 2018
24. (BRD) Brainerd, in Brainerd, MN – July 19, 2018
25. (DAK) Drake, in Fayetteville, AR – September 13, 2018
26. (FLP) Flippin, in Flippin, AR - September 13, 2018
27. (HLL) Handle, in Panama City, FL – September 13, 2018
28. (HVN) New Haven, in New Haven, CT – September 13, 2018
29. (IJX) Jacksonville, in Jacksonville, IL – September 13, 2018
30. (LAN) Lansing, in Lansing, MI – September 13, 2018
31. (LJT) Timmerman, in Milwaukee, WI – September 13, 2018
32. (LWV) Lawrenceville, in Lawrenceville, IL – September 13, 2018
33. (PNE) North Philadelphia, in Philadelphia, PA – September 13, 2018
34. (PSI) Pontiac, in White Lake, MI – September 13, 2018
35. (BUU) Burbun, in Burlington, WI – November 8, 2018
36. (TVT) Tiverton, in Tiverton, OH – November 8, 2018
37. (RID) Richmond, in Richmond, IN – January 3, 2019
38. (RUT) Rutland, in Rutland, VT – January 3, 2019
39. (VNN) Mount Vernon, in Mount Vernon, IL – January 3, 2019
40. (GNP) Glenpool, in Tulsa, OK – February 28, 2019
41. (MTW) Manitowoc, in Manitowoc, WI – February 28, 2019



Program Accomplishments cont'd

42. (ORD) Chicago O'Hare, in Chicago, IL – February 28, 2019
43. (CSX) Cardinal, in Cardinal, IL – June 20, 2019
44. (LSE) La Crosse, in La Crosse, WI – June 20, 2019
45. (MTO) Mattoon, in Mattoon, IL – June 20, 2019
46. (FRM) Fairmont, in Fairmont, MN – June 20, 2019
47. (ASP) Au Sable, in Oscoda, MI – August 15, 2019
48. (BQM) Bowman, in Louisville, KY – August 15, 2019
49. (GTH) Guthrie, in Guthrie, TX – August 15, 2019
50. (ISQ) Schoolcraft County, in Manistique, MI – August 15, 2019
51. (TPL) Temple, in Temple, TX – August 15, 2019
52. (GRV) Grantsville, in Grantsville, MD – October 10, 2019
53. (ELO) Ely, in Ely, MN – March 26, 2020
54. (GNL) Groesbeck, in Mexia, TX – March 26, 2020
55. (HUB) Hobby, in Hobby, TX – March 26, 2020
56. (HYR) Hayward, in Hayward, WI – March 26, 2020
57. (JXN) Jackson, in Jackson, MI – March 26, 2020
58. (SGH) Springfield, in Springfield, OH – March 26, 2020
59. (TDT) Tidioute, in Tidioute, PA – March 26, 2020
60. (CZQ) Clovis, in Fresno, CA – May 21, 2020
61. (EWA) Kewanee, in Kewanee, MS – May 21, 2020
62. (VWV) Waterville, in Waterville, OH – May 21, 2020



Program Accomplishments cont'd

63. (CCT) Central City, in Central City, KY – July 16, 2020
64. (CGI) Cape Girardeau, in Cape Girardeau, MO – July 16, 2020
65. (CIC) Chico, in Chico, CA – July 16, 2020
66. (HAB) Hamilton, in Hamilton, AL – July 16, 2020
67. (JEN) Glen Rose, in Glen Rose, TX – July 16, 2020
68. (MLC) Mc Alester, in Mc Alester, OK – July 16, 2020
69. (TDG) Talladega, in Talladega, AL – July 16, 2020
70. (BML) Berlin, in Berlin, NH – September 10, 2020
71. (GFL) Glens Falls, in Glens Falls, NY – September 10, 2020
72. (BDE) Baudette, in Baudette, MN – September 10, 2020
73. (BFD) Bradford, in Bradford, PA – September 10, 2020
74. (BWG) Bowling Green, in Bowling Green, KY – September 10, 2020
75. (CTW) Newcomerstown, in Newcomerstown, OH – September 10, 2020
76. (ECB) Newcombe, in Newcombe, KY – September 10, 2020
77. (ELZ) Wellsville, in Wellsville, NY – September 10, 2020
78. (IKK) Kankakee, in Kankakee, IL – September 10, 2020
79. (ISD) Winner, in Winner, SD – September 10, 2020
80. (RZN) Siren, in Siren, WI – September 10, 2020
81. (UIM) Quitman, in Quitman, TX – September 10, 2020
82. (ROM) Priest, in Priest, CA – September 10, 2020



Program Accomplishments cont'd

83. (FAH) Falls, in Sheboygan, WI – November 5, 2020
84. (LNR) Lone Rock, in Lone Rock, WI – November 5, 2020
85. (MKG) Muskegon, in Muskegon, MI – November 5, 2020
86. (RBA) Robinson, in Robinson, KS – November 5, 2020
87. (UKN) Waukon, in Waukon, IA – November 5, 2020
88. (ITH) Ithaca, in Ithaca, NY – December 31, 2020
89. (URH) Texoma, in Durant, OK – December 31, 2020
90. (AZQ) Hazard, KY – February 25, 2021
91. (CIP) Clarion, PA – February 25, 2021
92. (HON) Huron, SD – February 25, 2021
93. (PKD) Park Rapids, MN – February 25, 2021
94. (SUX) Sioux City, IA – February 25, 2021
95. (ANY) Anthony, KS – April 22, 2021
96. (BWS) Boles, in Alamogordo, NM – April 22, 2021
97. (LWB) Greenbrier, in Lewisburg, WV – April 22, 2021
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