

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

Program Update

Presented at: Aeronautical Charting Meeting (ACM)

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Federal Aviation
Administration



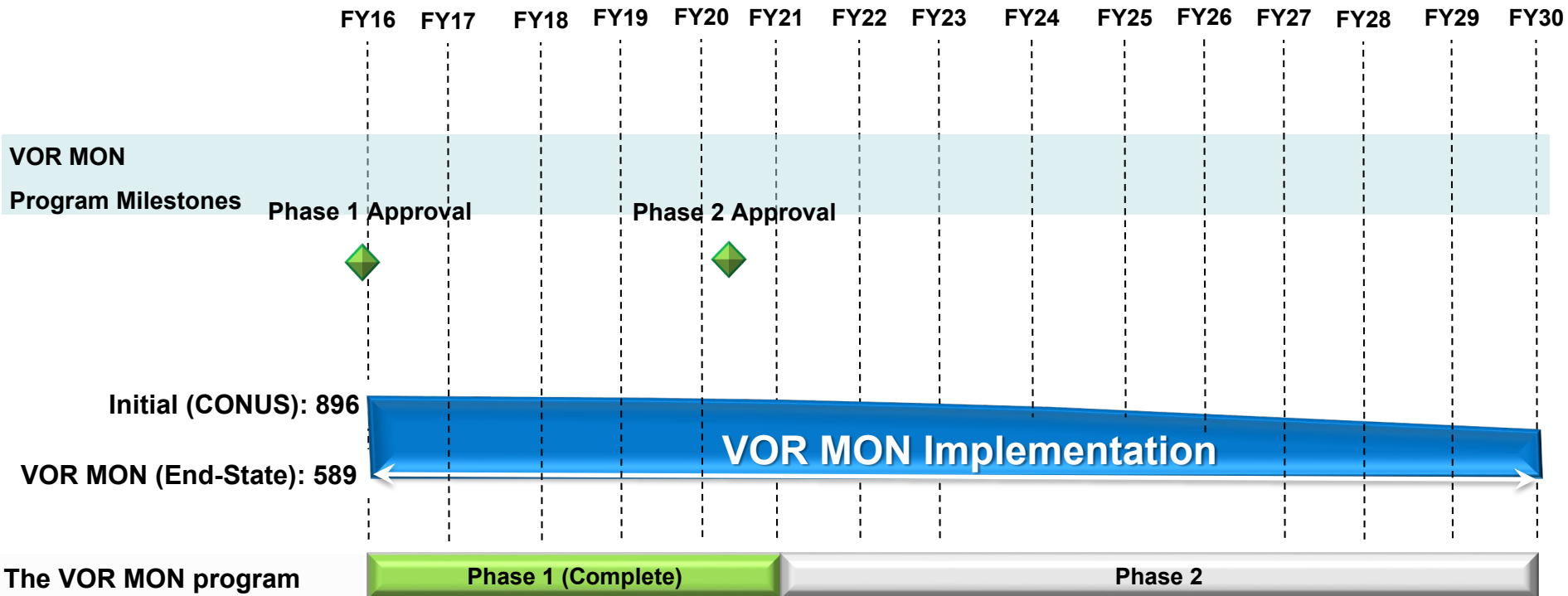
Agenda

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Objectives

- Support the National Airspace System (NAS) transition from VOR to Performance Based Navigation (PBN) consistent with NAS modernization goals.
- Enable pilots in the contiguous 48 states (CONUS) to revert from PBN to conventional navigation in the event of an unplanned Global Positioning System (GPS) outage. Pilots will be able to:
 - 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 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 mountainous terrain where surveillance services are not available and Minimum En Route Altitudes (MEAs) offer lower altitude selection for options in icing conditions.
- Discontinue approximately 34% (307) of VORs in the CONUS by FY30
 - The discontinuance process is governed by FAA Order 7400.2.

Timeline



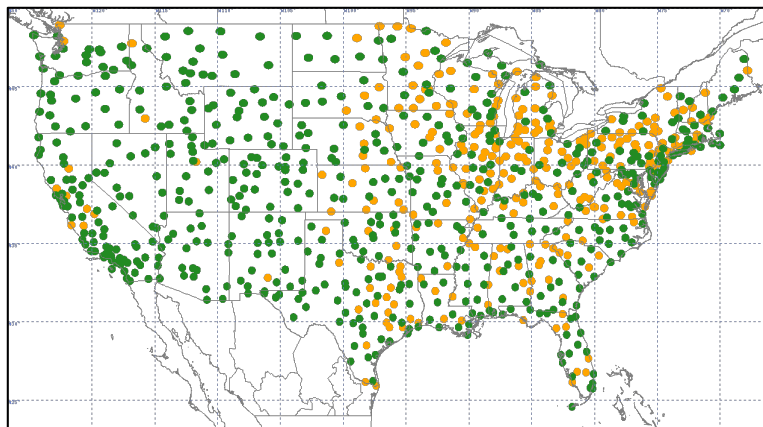
The VOR MON program will be completed in 2 Phases:

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 225 VORs
 - As of 4/22/2021, discontinued 15 VORs



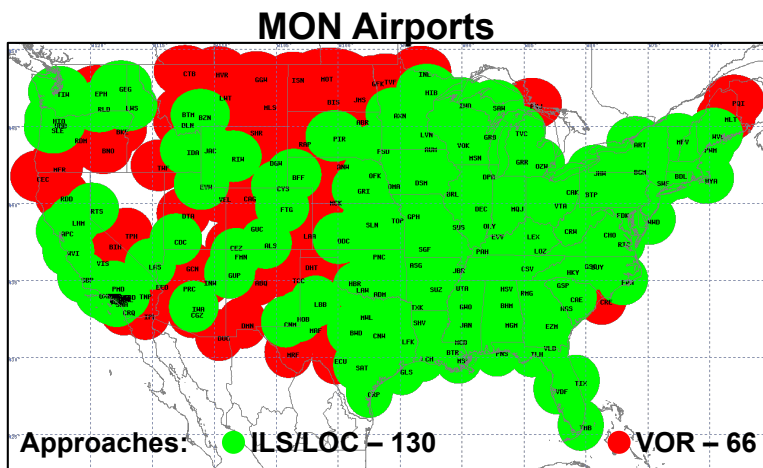
Candidate Discontinuance VORs & MON Airports



● Retained VORs (589)

● Candidate Discontinuance VORs (307)

Candidate Discontinuance VORs	
Service Area	VOR #
Western	17
Central	182
Eastern	108
Total	307



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.

VOR Configurations (as of April 22, 2021)				
	Retention #	Discontinuance (Remaining) #	Current Total	Total Discontinued
VOR	16	7	23	6
VOR/DME	214	102	316	50
VORTAC	359	101	460	32
Total	589	210	799	97

Program Accomplishments

- **Discontinuances since last ACM:**

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

Planned Activities

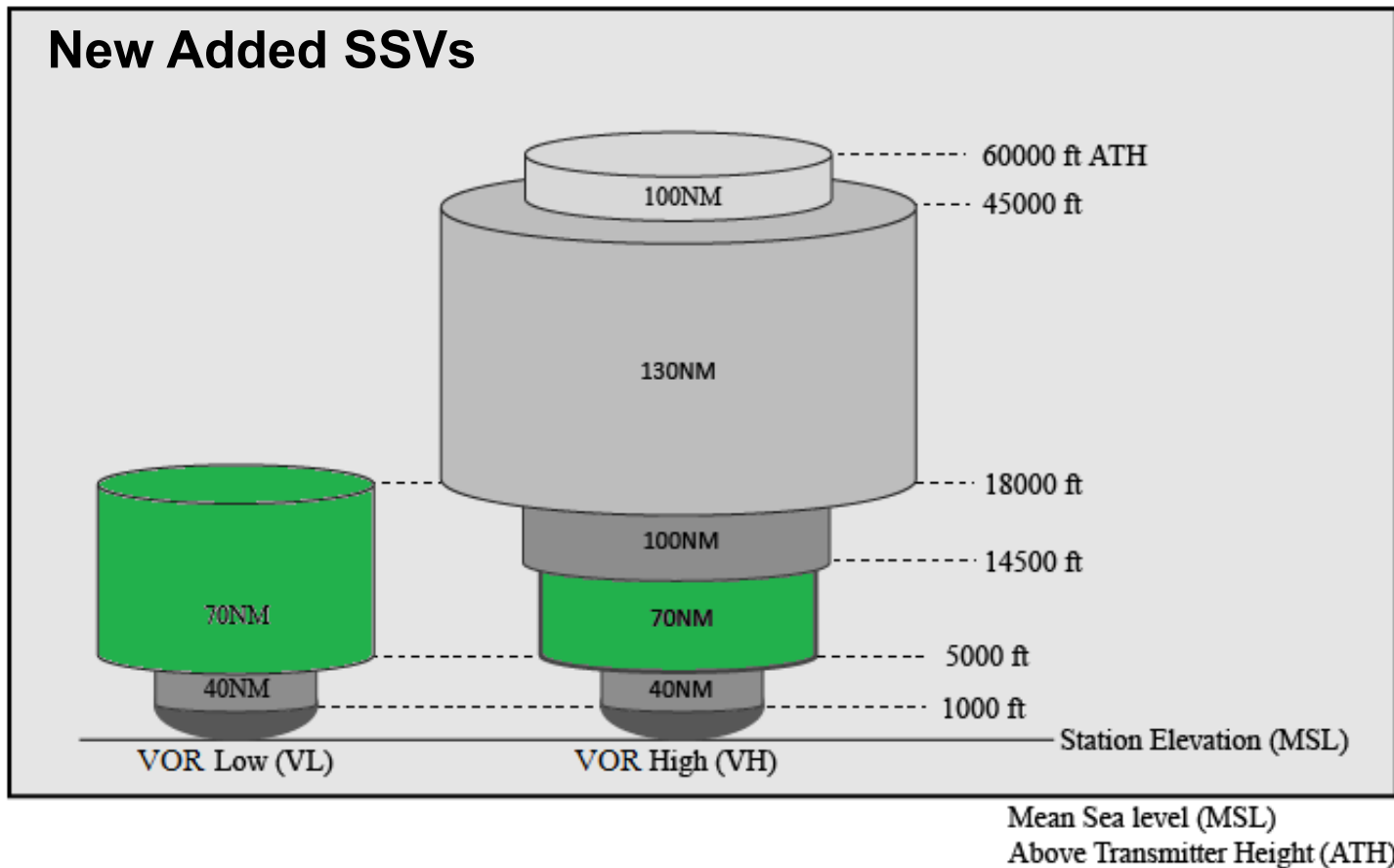
- Discontinue six (6) VORs – **June 17, 2021:**
 1. (HNN) Henderson, WV
 2. (LEB) Lebanon, NH
 3. (LWM) Lawrence, MA
 4. (MSS) Massena, NY
 5. (MWA) Marion, IL
 6. (SLK) Saranac Lake, NY
- Discontinue six (6) VORs – **August 12, 2021:**
 1. (DCU) Decatur, AL
 2. (GBG) Galesburg, IL
 3. (MAP) Maples, MO
 4. (STS) Santa Rosa, CA
 5. (UCA) Utica, NY
 6. (VQQ) Jacksonville, FL

Planned Activities cont'd

- Discontinue five (5) VORs – **October 7, 2021:**
 1. (EEN) Keene, NH
 2. (HUL) Houlton, ME
 3. (MCM) Macon, MO
 4. (PSM) Portsmouth, NH
 5. (RFD) Rockford, IL



Two New VOR Standard Service Volumes



Two New VOR Standard Service Volumes cont'd

- MON VORs are being flight checked for 70 nautical miles (NM) coverage at 5,000 feet Above Ground Level (AGL)
- Information will be uploaded into the FAA National Airspace System Resource (NASR) database
 - Coding changes
 - Chart Supplement will be updated
 - Time to complete: within 6 months
- Airman's Information Manual (AIM)
 - Published with the new Standard Service Volumes (SSVs) - December 31, 2020

Next Steps

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

Questions



Backup



Program Accomplishments

97 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

