

Frequently Asked Questions Supplemental Adaptive Intra-Volume Low-Level Scan (SAILS)

Question: What is SAILS?

The concept of SAILS is to add a supplemental 0.5° split cut* scan to the existing severe weather VCPs 12 and 212. This new split cut scan will be inserted into the “middle” of the volume scan to evenly space the time intervals between 0.5° data updates. The “middle” of the volume scan is adaptive and determined in real-time because volume scan completion times vary due to change in termination angle determined by AVSET (see the table below).

Elevation Angles (VCP 12)	VCP 12 Elevation Duration	Termination Angle = 19.5	AVSET Termination Angle = 15.6	AVSET Termination Angle = 12.5	AVSET Termination Angle = 10.0	AVSET Termination Angle = 8.0	AVSET Termination Angle = 6.4
0.5°	31 Sec	31 Sec	31 Sec	31 Sec	31 Sec	31 Sec	31 Sec
0.9°	31 Sec	31 Sec	31 Sec	31 Sec	31 Sec	31 Sec	31 Sec
1.3°	31 Sec	31 Sec	31 Sec	31 Sec	31 Sec	31 Sec	31 Sec
1.8°	15 Sec	15 Sec	15 Sec	15 Sec	15 Sec	15 Sec	15 Sec
0.5°						31 Sec	31 Sec
2.4°	14 Sec	14 Sec	14 Sec	14 Sec	14 Sec	14 Sec	14 Sec
0.5°				31 Sec	31 Sec		
3.1°	14 Sec	14 Sec	14 Sec	14 Sec	14 Sec	14 Sec	14 Sec
0.5°		31 Sec	31 Sec				
4.0°	14 Sec	14 Sec	14 Sec	14 Sec	14 Sec	14 Sec	14 Sec
5.1°	14 Sec	14 Sec	14 Sec	14 Sec	14 Sec	14 Sec	14 Sec
6.4°	14 Sec	14 Sec	14 Sec	14 Sec	14 Sec	14 Sec	14 Sec
8.0°	13 Sec	13 Sec	13 Sec	13 Sec	13 Sec	13 Sec	
10.0°	13 Sec	13 Sec	13 Sec	13 Sec	13 Sec		
12.5°	13 Sec	13 Sec	13 Sec	13 Sec			
15.6°	13 Sec	13 Sec	13 Sec				
19.5°	13 Sec	13 Sec					
Duration	243 Sec	274 Sec	261 Sec	248 Sec	235 Sec	222 Sec	209 Sec
0.5 Elevation Update Times	243 Sec	136 Sec and 138Sec *	136 Sec and 125 Sec *	122 Sec and 126 Sec *	122 Sec and 113 Sec *	108 Sec and 114 Sec *	108 Sec and 101 Sec *
* Plus Retrace Time							

**Split Cut is a term used to describe the technique of scanning a particular elevation two or more times, using a different PRF for each full scan. This technique is used to accurately place targets in range using a low PRF and to collect accurate velocity data using a high PRF.*

Question: Why collect Split Cut scans instead of a Batch mode scan?

Answer: Split Cut data collection was chosen because it provides the required number of samples to ensure effective clutter filtering, provides range unambiguous reflectivity data which is the basis to range unfold velocity data and supports Super Resolution data processing. Split Cut scanning to collect the supplemental 0.5° scan takes approximately 31 seconds. We looked at using a Batch mode scan, but to collect enough Surveillance pulses to support GMAP clutter filtering it would take approximately 30 seconds to complete the rotation. Another drawback with Batch mode is the azimuthal spacing does not support Super Res. So, if we use Split Cut processing we 1) complete the data collection in approximately the same time as Batch, 2) achieve a greater level of clutter filtering, and 3) benefit from Super Res processing.

We also thought about a single Surveillance scan (17 sec) – but think that the vast majority of forecasters will want the Doppler data for severe storm interrogation.

A single Doppler scan (14 sec) presents the difficult problem of range unfolding the new scan using power data that is ~2 minutes old.

Question: Which products/data will be available from the new scan?

Answer: The RPG will support generating the base products DR (94), DV (99), SDR (153), SDV (154) and SDW (155) from the SAILS elevation data. For these products generated from the SAILS supplemental scan data, the start of the volume time in the Product Description Block is substituted with the start of elevation time. This is necessary to distinguish the supplemental scan products from the products generated from the first split cut in the VCP.

Question: Are there any hardware wear and tear issues noted or expected?

Answer: No. With SAILS the rotation rates do not change and the maximum antenna elevation transition is 3.5 degrees so there is no abnormal pedestal impact while executing SAILS. In fact, the worst VCP we have for antenna elevation transition is VCP 21 because of the large scanning elevation gaps.

Question: Will RPG algorithms be fed this data for processing?

Answer: The RPG infrastructure manages the flow of data to each algorithm based on the algorithm's request for the specific data (type and elevation). Until or unless a particular algorithm requests the new 0.5° data, the RPG will not send it for processing. This architecture supports the field deployment of SAILS without waiting for algorithm development required to incorporate this new data. However, by including this new scan in the Level II data stream algorithm developers can enhance/correct/modify their algorithms, if they

wish to use the new data input, without delaying SAILS field implementation. Any algorithm updates and enhancements will be included in future RPG builds.

Question: How do agency display platforms (e.g., AWIPS, OPUP) get the new 0.5° products?

Answer: The RPG supports request mechanisms that allow the user to simply request the 0.5 product and they will get the “first” generated 0.5 product. Or they may request all 0.5 products and they will get all generated 0.5 products (in this case AWIPS tracks them based on generation time). The OPUP will be modified to behave in a similar way. WARP/ITWS will also be modified if the FAA decides they want/need these products.

Question: Will SAILS be turned on/off by the operator (like a toggle on the front panel) or will it be hard coded into the VCP?

Answer: The current planning is for SAILS to be enabled with a Toggle that turns it on and off (similar to AVSET).

Question: Will SAILS be available to use with all VCPs?

Answer: No. Initially, SAILS will only be available to use with VCP 12 and VCP 212.

Question: Have you done any live testing?

Answer: Yes, using a non adaptive VCP (test VCP 15) where we simply hard-coded a split-cut scan in the middle of a VCP. This was done to perform proof-of-concept testing, to provide processing and bandwidth load information, and to collect Level II data.

Question: I heard something about other programs - SILS or SNAILS. What are they about?

Answer: SAILS = Supplemental **Adaptive** Intra-Volume Low-Level Scan

We currently do not have the infrastructure in place to **Adaptively** insert the new scan in the "middle" of a volume scan based on completion time. For testing, I simply hard-coded a VCP (VCP 15) with the new split-cut scan inserted between the 1.8 and 2.4 elevations. To ensure that we keep our testing of SAILS distinguishable from our initial non-adaptive VCP tests, we started referring to these initial test cases as SILS (Supplemental Intra-Volume Low-Level Scan) - then it became SNAILS (Supplemental Non Adaptive Intra-Volume Low-Level Scan). Again, this was done because we were not able to test the Adaptive part of SAILS.

SAILS is the goal. SNAILS (also referred to as SILS) is our current (March 2012) capability.