RTCA Special Committee 186, Working Group 3

ADS-B 1090 MOPS, Revision A

Meeting #5

ACTION ITEM 4-3

Revision to Appendix A to Eliminate Range-Based Decoding

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SUMMARY
At Meeting #4, it was agreed to eliminate the range-based CPR decoding technique. **This working paper presents a proposed change to Appendix A for this purpose.**

A.7.8 CPR Decoding of Received Position Reports

A.7.8.1 Overview

Note: The techniques described in the preceding paragraphs (locally and globally unambiguous decoding) are used together to decode the lat/lon contained in airborne, surface, and TCP or TCP+1 position reports. The process begins with globally unambiguous decoding based upon the receipt of an even and an odd encoded position squitter. Once the globally unambiguous position is determined, ~~either of two approaches may be used to support subsequent decoding based upon a single position report, either even or odd encoding. The two techniques are Range Monitoring and Emitter Centered Local Decoding~~, the emitter centered local decoding technique is used for subsequent decoding based on a single position report, either even or odd encoding.

~~**A.7.8.2 Range Monitoring Local Decoding**~~

~~**A.7.8.2.1 Range Monitoring Technique**~~

~~In this approach, local decoding for the airborne format (Section A.7.4) shall be performed based upon the current position of the receiver. This shall provide the position of a transmitting aircraft that is unambiguous to plus or minus 180 NM.~~

~~*Note 1: If the transmitting aircraft is within 180 NM, the local decoding technique will correctly decode the location of the aircraft.*~~

~~The range of the transmitting aircraft shall be checked at detection and track shall only be initiated if the range is less than 180 NM. Once initiated, the range of the tracked aircraft shall be checked each update and the track shall be dropped if the range becomes equal to or greater than 180 NM.~~

~~For the surface format, the same process shall be used except that the transmitting aircraft must be within 45 NM for detection and tracking.~~

~~*Note 2: The range limits are reduced since the ambiguity limit for the surface position reports is one-fourth that of the airborne case*~~

~~**A.7.8.2.2 Range Monitoring Example**~~

~~**A.7.8.2.2.1 Decoding of Airborne Position**~~

~~**A.7.8.2.2.1.1 Detection**~~

~~At detection, a globally unambiguous decode shall be performed. If range is greater than 160 NM, the detection attempt shall be discontinued and the track information discarded. Detection shall be attempted if squitters continue to be~~

~~received. If the globally decoded range remains greater than 160 NM, the track information shall continue to be discarded.~~

~~*Note: If the aircraft is approaching, detection will succeed when the range decreases to less than or equal to 160 NM.*~~

~~**A.7.8.2.2.1.2 Track Monitoring**~~

~~After detection, range shall be monitored each surveillance update. If range is greater than 170 NM, the track shall be dropped.~~

~~*Note: The use of 160 NM for detection and 170 NM for track drop provides hysteresis that avoids reacquiring a track that was just dropped due to long range. Thus a track dropped at 170 NM would not be reacquired unless its range dropped to less than or equal to 160 NM.*~~

~~**A.7.8.2.2.2 Decoding of Surface Position**~~

~~Using the Range Monitoring technique for decoding squitters in the surface format, the same process as above shall be used except that the track is initiated at 40 NM and dropped at 42.5 NM.~~

A.7.8.2~~3~~ Emitter Centered Local Decoding

In this approach, the most recent position of the emitter shall be used as the basis for the local decoding.

Note: This produces an unambiguous decoding at each update, since the transmitting aircraft cannot move more than 360 NM between position updates.

~~**A.7.8.4 Technique Application**~~

~~*Note: The Range Monitoring technique can be used where ranges greater than or equal to 180 NM are not needed, for example in air-to-air applications. The Emitter Centered technique can be used for both airborne receivers and ground stations. For ground stations (i.e., non-aircraft implementations) that are required to operate at ranges in excess of 180 NM, the Emitter Centered technique must be used.*~~