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Proposal for ASSAP Application Selection

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Summary
This working paper proposes a method for selecting amongst the initial five applications.

Most of the material I am presenting in this paper is the consensus, as I interpret it, of the ASSAP working group over the past few meetings.

So to review, the five applications of interest are:
Enhanced Visual Acquisition (EVAcq)
Airport Surface Situational Awareness (ASSA)
Final Approach and Runway Occupancy Awareness (FAROA)
Enhanced Visual Approach (EVApp)
Conflict Detection (CD)

From the ASSAP point of view, EVAcq is active all the time. Thus, ASSAP will accept Reports from the link receiver and generate tracks to deliver to the CDTI interface marked as invalid/degraded/good for ASSA, FAROA and degraded/good for EVAcq. Targets deemed invalid for EVAcq will not be sent to the CDTI interface. Per the Seattle meeting, ASSA/FAROA criteria should only be applied to surface targets presented on an airport map. This knowledge is held by the CDTI function and ASSAP does not need to know if this depiction is presented or not. CDTI will use these limits to depict traffic on the surface map if available. If a surface map is not available, CDTI may choose to depict surface traffic using the EVAcq limits as a fall back.

ASSAP will send target altitude relative to own ship. ASSAP will calculate this using pressure altitude. If pressure altitude for own ship or target is invalid, relative altitude will NOT be calculated using Height Above the Ellipsoid for both ships. ASSAP will send target Air/Ground status. The implication is that CDTI may use relative altitude or Ground/Air status to filter targets on the display.

The subset of targets tracked that are sent to the display will be prioritized based on the state of own aircraft. For instance, surface targets may not be sent when own aircraft is not in the terminal area. How does ASSAP know it is in the terminal area? This should be left to the manufacturer. It could be something as simple as selecting ASSA/FAROA as a unique page on a display. It could be a complex examination of onboard sensors including airspeed, radio altitude, terrain databases, throttle settings, flap and gear settings, etc. For a given aircraft, the ASSAP vendor and OEM together are capable of designing phase of flight logic that may be used to inform ASSAP it is in the terminal area. As a minimum requirement, I propose that ASSAP accept an input indicating surface targets should be included. If ASSAP or other onboard system is capable of automatically determining phase of flight, ASSAP may use that information to determine if surface targets are to be included in lieu of a dedicated input. This input will constitute the selection of ASSA/FAROA.

If implemented, ASSAP will indicate that target information is good/invalid for CD. If implemented, ASSAP will indicate that target information is good/invalid for EVApp.

A selected/highlighted target will have additional information sent to CDTI by ASSAP. The additional information consists of Flight ID, Emitter Category, Ground Speed,

Range, Closure Rate. CDTI will send the selected/highlighted target to ASSAP. If the information is not available or cannot be calculated, it will be marked as invalid on the interface to CDTI. As a minimum requirement, the selected/highlighted target sent from CDTI to ASSAP constitutes the selection of EVApp.

A coupled target will have application specific information sent to CDTI by ASSAP. Coupled targets' data is sent to CDTI even when they are not selected/highlighted. CDTI will send a list of targets coupled to applications to ASSAP. The status of the application depends on the validity of the source data and operational parameters. CDTI may need to send operational parameters for an application to ASSAP. For example, CDTI may send a time in trail target value for a Merging and Spacing application.

A target whose operational parameters are all met is considered an Engaged target. Engaged is a proposed concept from ARINC-735B.

A manufacturer may elect to implement the coupled and engaged concepts for EVApp if desired.

The CD application is likely to be tailored to the type of aircraft it is installed on. Different classes of aircraft perform different operations that could make a one-size-fits-all implementation problematic. On faster, more complex aircraft, CD would likely benefit from changing the alert criteria based on the phase of flight. As stated above, phase of flight determination is a design issue best left to the OEM and ASSAP vendor. As minimum requirement, when implemented, the CD application will operate continuously on targets that meet the CD criteria. As a minimum requirement, ASSAP will accept an input that indicates CD alerts should be inhibited. The CD inhibit input constitutes application deselection.