

Requirements for the Recon Commander DMP

Vision

The Recon Commander DMP has the job of providing information on enemy and friendly troop placements and movements to the battle commander. This is accomplished by dynamic allocation of reconnaissance assets (RSVs and UAVs) to designated areas of interest. Their sensor reports will make up the required information. The information gathered is disseminated to (higher echelon) battle elements. Allocated assets are monitored and can be dynamically deployed when either a recon. asset is unable to fulfill its mission, or its mission becomes irrelevant.

Requirements

- A. Information flow to and from battle commander.
 - a. Echelon. The Recon Cdr. can receive orders from a battle commander at Company level or above.
 - b. Information from Battle Cdr. The Recon Cdr. receives orders as CCIRs (Commanders Critical Information Requirements). These can be PIRs (Priority Information Requirements), FFIRs (Friendly Force Information Requirements) or possibly EEFI (Essential Elements of Friendly Information).
 - c. RS Plan. The Recon Cdr. will act execute an RS (Reconnaissance and Surveillance) Plan tied to the selected template response of the Battle Cdr. The plan consists of a number of questions, each one associated with either a PIR, FFIR, or EEFI.
 - d. The Recon Cdr. relays answers to the CCIR questions in the form of perceptions, enemy or friendly, as they become available.
- B. PIR
 - a. A question about enemy placement and movement in time and space. A PIR is tied to one or more Named Areas of Interest (NAI) or Targeted Areas of Interest (TAI).
 - b. An NAI (TAI) has one or more observation points protected from the enemy that provide sensor coverage of the area (for RSVs). These are chosen dynamically by the Recon Cdr. It also has one or more dropoff points from which RSV scouts are deployed to an observation point.
 - c. A TAI has, in addition, perceptions of one or more enemy units to be targeted for fire.
 - d. Each PIR has an associated priority level. Higher priority PIRs will be executed first.
- C. FFIR
 - a. Questions about placement and movement of friendly troops in time and space. An FFIR is tied to one or more NAIs.

- b. An NAI has one or more observation points that provide sensor coverage of the area. It also has one or more dropoff points from which RSV scouts are deployed to an observation point.
- D. EEFI
 - a. Questions about protecting friendly assets from enemy attack. EEFI is tied to one or more NAIs or TAIs.
- E. RS Plan allocation. The assignment of available Recon assets (RSV or UAV) to a CCIR question and its associated NAIs/TAIs.
- F. Asset assignment. The Recon Cdr. will:
 - a. Dynamically allocate assets to questions. The goal will be to provide maximal sensor coverage for every NAI in the RS Plan. Assets will be polled for their readiness before being allocated. The priority level of the PIR will be taken into account and the higher priority PIRs executed first.
 - b. Choose appropriate RSV observation points for each NAI by choosing positions that allow for greater sensor coverage while minimizing exposure to the enemy.
 - c. Reallocate assets:
 - i. when their mission is complete
 - ii. when their mission is rendered irrelevant by battlefield events
 - iii. to replace inactive assets (dead or immobile)
 - iv. when the RS Plan changes due to template response change
 - d. Monitor the health of assets to determine their mission status. An asset's status can be:
 - i. ready for mission
 - ii. in transit
 - iii. arrived at goal
 - iv. executing mission
 - v. completed mission
 - vi. immobile
 - vii. assumed to be dead
- G. Mission assignment: RSVs. An RSV will be tasked to "Observe Area" and given a goal point (the dropoff point of the NAI), an observation point, way points on a path to the goal and an ETA. RSVs will be expected to inform the Recon Cdr. when a task becomes impossible to carry out, either as a result of immobility or lack of time. RSVs will be expected to protect themselves against enemy attack, and this will take priority over the mission.
- H. Deployment. When an RSV reaches its dropoff point, its scouts dismount and walk to the corresponding observation point of the NAI. They spread out into a suitable formation for observation. When the RSV is to be reallocated, the scouts walk back to the vehicle and mount for travel elsewhere.
- I. Mission assignment: UAVs. A UAV will be tasked to "Observe Area" and given an NAI. The UAV will travel to the NAI at a fixed height and cycle over the area. It will send a message "mission complete" when one cycle has been completed.
- J. Execution interval. The initial allocation of assets will occur when the Recon Cdr. receives the plan from the Battle Cdr. Assets will only be allocated when known to be alive. After that point, the Recon Cdr. will monitor the health of the

- allocated assets every 15 minutes (configurable), and execute reallocation as necessary.
- K. Mission reassignment. If the Battle Cdr's. response changes, the RS Plan will change as well. RSVs which are currently deployed will be recalled, as will UAVs, to be ready for reallocation.

Storage

The Recon Cdr. will keep the following information:

- A. A list of available RSVs from the team roster.
- B. A list of available UAVs from the team roster.
- C. The health of each asset.
- D. An RS Plan consisting of a set of questions, each of which has an associated PIR, FFIR, or EEFI. This is relayed to the Recon Cdr. from the Battle Cdr. as part of the chosen response (see the CO DMP requirements document).
- E. Whether a new plan has been received.
- F. Whether the plan has been acted on, i.e. that each question has been addressed by allocation of assets.
- G. The allocation of each asset to a question. There can be multiple assets for each question.
- H. The chosen observation and dropoff points, the path way points and ETA for each NAI/TAI.
- I. The execution interval (from configuration).

Inputs

- A. External
 - a. The execution interval
- B. Internal (comms. messages)
 - a. The RS Plan
 - b. "I'm alive" from assets.
 - c. "I've completed my mission" from assets.

Outputs

- A. External. Auditing will be carried out to report on:
 - a. When a new RS Plan is received
 - b. The allocation of an asset or assets to a question.
 - c. The chosen observation points, dropoff points, path way points and ETA for a question.
 - d. The reallocation of an asset to a new question.
 - e. The report of "mission complete" from an asset.
- B. Internal (comms. messages)
 - a. "Are you alive?" to assets.
 - b. "Observe area" (With NAI/TAI, dropoff, OP, way points, ETA) to assets.

External Needs

The Recon. Cdr. needs to determine sensor coverage for a candidate observation point and an NAI. Observation points will be chosen such that the sensor coverage is maximized.