**Rules Engine - JTacticalSim**

*Play is turned based open play. Units can be selected and moved in any order within the constraints of remaining movement points which are tracked during the turn for each unit. Battle can occur only once per turn/per unit.*

***Anatomy of turn***

1. Select reinforcements
   1. Units can be acquired based on reinforcement points
2. Make movements
   1. Assignments/Re-assignments
   2. Combat and non-combat moves -- movement points calculated during moves
   3. Do combat -- unit statuses calculated --supply??
3. Place reinforcements
   1. Land-based reinforcements allowed at any faction held improved, land boundary node
   2. Water-based reinforcement allowed at any faction held water boundary node
   3. Air-based reinforcements allowed at any faction held boundary node
4. End turn
   1. Reinforcement points collected.
   2. Victory points calculated
   3. Victory condition checked
   4. Unit stats calculated
   5. Task stats calculated
   6. Movement stats reset

***Anatomy of a select***

* Left Click selects unit
* Right Click gives unit options (Unit orders/tasks)
  + Load Units (if available transport)
  + Attack Remote (if valid for unit)
  + Attach to unit/Detach from unit

***Anatomy of a move***

* Select unit(s)
* [Load for transport]
  + From current or adjacent cell
* Select cell for move
* [Offload units]
* Move units node by node
  + Handle automatic actions
    - Flyover anti-aircraft
    - Forced engagement (dependent on unit stealth??)
* Select unit action (orders) at movement cell
  + All selected units participate in action for current move
  + Enemy cell
    - If no enemy, cell is conquered
    - If enemy, do combat
  + Friendly cell
    - Occupy cell
    - Fulfil orders/tasks
      * E.g. supply units, build roads/bridges, etc…
* [Make post-combat move]
  + Non-combat only
  + To available movement points

***Anatomy of a Local Battle***

* Attackers move to occupied cell
* Battle is created with all attackers and defenders at cell
* Air defence units fire
  1. One shot per unit per attacking air unit
  2. No return fire
* Round is created
  1. Skirmishes created based on attacker vs. prime defender target
  2. Skirmishes resolved for round
     + Skirmish updates battle master list of attackers/defenders
* Round ends when all skirmishes are resolved
  1. Victory condition is checked
     + Faction with any remaining units
       - If defender, no condition
       - If attacker, must have a ground unit
       - If neither, defender holds the cell
  2. Attacker given option to retreat if no victor
     + Within remaining movement point constraints
* If no victor and no retreat, create new round
* Battle end conditions
  1. Victory declared
  2. No suitable defenders for remaining attackers (no skirmishes created)
     + Attackers automatically retreat
       - If no suitable space is found, attacker is destroyed

***Anatomy of a Remote Battle (Barrage)***

* Battle is created with attacking units and valid defending units
  1. One space per remaining attack distance value for all units, attackers and defenders.
     + Engagement of unit is based on movement cache value for unit
* Round is created
  1. Skirmishes created based on attacker vs. prime defender target
  2. Skirmishes resolved for round
     + Skirmish updates battle master list of attackers/defenders
     + Skirmish updates movement cache
       - * Decrements available by used attack distance for all units
* Round ends when all skirmishes are resolved
  1. Victory condition is checked
     + Faction with any remaining units engaged in the barrage
       - If defender, no condition
  2. Attacker given option to halt barrage if no victor
* If no victor and barrage not halted, create new round
* Battle end conditions
  1. Victory declared
  2. No suitable defenders for remaining attackers (no skirmishes created)
  3. No attack units with attack distance values remain

***Orders/Tasks fulfillment***

* After movement
* One order action point per turn, per squad
  + Orders follow COC and is assigned to highest level unit that can accept the order.
  + Tasks are completed by task-associated squads at location.
  + multiple squads must be attached to company that has orders for the task to get the multiple cost bonus
  + e.g. If a bridge build costs 10 action points, 3 squads allowable for task would be 4 turns to complete if all 3 squads are attached to a company that receives the order (default admin staff is not considered)
* Orders dropped if moved before completion

***Unit Assignments***

* Can Assign Unit: a unit marker can only be assigned to another unit at the next highest level in the COC.
* Each organizational unit (above squad) contains 1 squad by default as an administrative staff.
  + This staff is factored into some modifications (e.g. UnitWeight) but not others (e.g. Order Action Point costs)
* Battalions can have a max of 6 Companies. Support penalty after 4.
* Companies can have a max of 12 squads. Support penalty after 8.

***Unit Movement***

* Node Is Allowable: Units can move to any node that matches its geographic constraints + improvement modifiers. Action Options are returned based on node faction and enemy units present.
  + Maximum units?
* Node Is Reachable: Units can move to any allowable node within the reach of their remaining action points. If the chosen route takes them through/over a location with enemy units and the enemy units are capable of combat with the unit, the unit must do battle.

**Rules – Engine**

***Tile Is Allowable For Unit***

* Determines whether a unit can occupy a tile
* Pass through for ***Tile Is Allowable For UnitType***

***Tile Is Allowable For UnitType***

* Determines whether a unit type can occupy a tile
  + Tile must have at least one geography demographic compatible with the unit, no geography demographics, or an override for the unit

***Tile Has Movement Override For Unit***

* Determines whether a tile has an override for a given unit
* Pass through for ***Tile Has Movement Override For UnitType***

***Tile Has Movement Override For UnitType***

* Determines whether a unitGeogType override exists for any geography demographic of a tile given a unit.

***Node Is Valid For Move***

* Determines whether a target node’s current tile is valid for a given unit to occupy
* Pass through for  ***Get Allowable Movement Nodes For Unit***

***Get Allowable Movement Nodes For Unit***

* Unit has movement points
* Unit must be able to occupy the node’s current tile
* Unit must have a connected path to the node within its remaining movement points value

***Calculate Total Unit Weight***

* Calculated based on total number of squads
  + One Weight Base factor for each squad
  + One Weight Base factor for any unit above squad (unit’s default squad)
* Total of the sum of all units’ Weight Modifiers multiplied by Weight Base

***Calculate Movement Heuristic***

* Based on supplied heuristic algorithm, determines a ‘weight’ for a component based on its current location in relation to the source component during pathfinding.

***Calculate Victory Points***

* Determines the total victory points held by a player
  + Total of faction-held nodes’ victory points and total number of remaining faction units

***Calculate Unit Attack Value For Current Geography***

* Determines the net attack value for a unit based on the geography of its currently occupied node
  + Factors:
    - Unit net attack adjustment
    - Node’s default tile’s net attack adjustment
    - If attached, HQBonus value
    - If supplied, SuppliedBonus value
    - Combat base value
  + Minimum 0 value
  + Maximum base combat roll value

***Calculate Unit Defense Value For Current Geography***

* Determines the net defense value for a unit based on the geography of its currently occupied node
  + Factors:
    - Unit net defense adjustment
    - Node’s default tile’s net defense adjustment
    - If attached, HQBonus value
    - If supplied, SuppliedBonus value
    - Combat base value
  + Minimum 0 value
  + Maximum base combat roll value

***Calculate Unit Strength***

* Determines total strength factor for a given unit
  + Factors:
    - Unit net cost multiplier
    - Unit net attack adjustment
    - Unit net defense adjustment
    - Unit movement points
    - Unit net attack distance adjustment

***Calculate Target Desirability For Unit***

* Determines a desirability factor for a given unit
  + Factors:
    - Unit strength factor
    - Total attached units multiplied by target attached unit bonus value
    - If unit is medical, target medical unit bonus
    - If unit is supply, target supply unit bonus

***Unit Can Do Battle With Unit***

* Determines whether a unit can do battle with another unit based on battle type
  + Target unit has geogtype allowable for source unit
  + If this is a remote battle, target unit must be within reach of source unit based on remaining remote fire points

***Unit Can Attach To Unit***

* Target unit must be one level higher in the org hierarchy than the source unit

***Unit Is Supplied***

* Determines whether there is a friendly supply unit with a connected route to the source unit within the max supply distance.

***Unit Has Medical Support***

* Determines whether a given unit qualifies for the medical support bonus
  + Unit IS medical
  + Unit has a medical unit at the same location and the unit is not a type that is disallowed for medical support (based on logical logistics)
    - Plane types
    - ???