SATELLITE OVERVIEW

ORBITAL REGIMES

SCENARIO MODE

BUILD A SATELLITE

OPPORTUNITY SCHEDULER

GROUND STATION VIEW
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PRAIRIE

The rapid growth of the space enterprise, from commercial interests in space exploration to a potentially adversarial domain, has created demand for faster, more agile tools for space operations. The Prairie platform, based on gaming industry technology, will give users the ability to train for space engagement by fusing architecture, technology and space operations together in a unique, open-source package. Operators will be able immediately to practice skills and test new technologies in a "Prairie-safe" environment, before operating new systems in space. The Prairie architecture protects security-sensitive and proprietary information to leverage cloud computing for multiuser collaboration.

Marrying decades of Aerospace domain expertise with commercial technologies, the Prairie platform will deliver an ecosystem of advanced tools with intuitive, streamlined interfaces and the ability to quickly create operational scenarios—using low-fidelity calculations for rapid exploration then switching to high-fidelity modeling and simulation to determine requirements. Additionally, Prairie will have the capability to operate a fleet of DevOps satellites directly from the dashboard for integration and evaluation of new technologies.

Features of the Prairie Platform

- **Prairie leverages commercial R&D and productization investments.** Flexible and agile, the platform can use both Unreal and Unity game-engines to rapidly create mission scenarios for space operations. Both the User Interface (UI) and User Experience (UX) are designed to speed proficiency and mitigate information overload, and the Prairie UI can be readily modified based on operator feedback.

- **Stunning visuals give operators a clear picture of what is happening.** Operations will continue to become more hectic with increased amounts of debris, faster launch tempo, and increased in-space activities—all leading to a risk of cognitive overload for users. Prairie's visuals help distinguish specific activity, enabling faster and improved decision making.

Prairie Facts

The Prairie platform is based on commercial gaming technology that can be used for:

- › Space Operations Training
- › Developing Operational Tactics
- › Wargame Planning
- › Architectural Digital Twins
- › Trajectory Analysis and Planning
- › System Modeling/Simulation
- › DevOps for Space Operations
- › Operating Satellites with Augmented AI
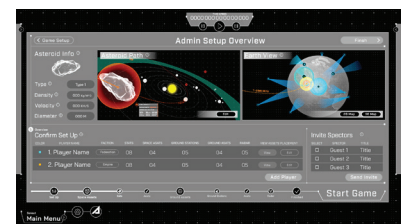
Game-based UX. Prairie leverages commercial and open-source gaming technologies. This reduces development time while providing the best-in-class interfaces and game play for simulating space missions.
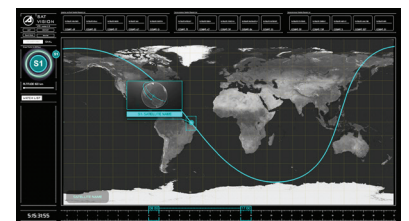

Stunning Visuals. Prairie utilizes game-engine technology and high-quality visualizations to make the interfaces intuitive and easy to learn.
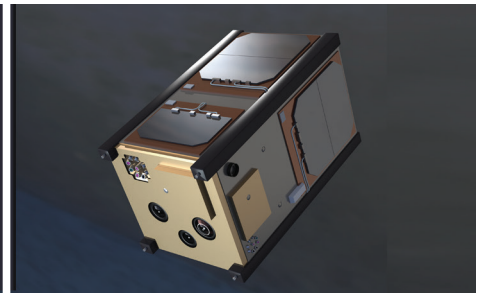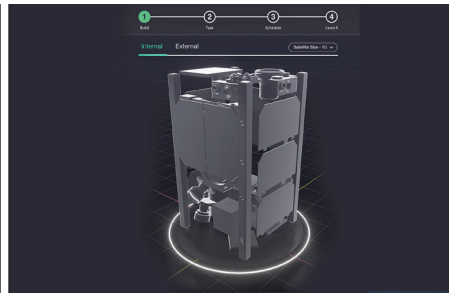
Agile Development. With Prairie, Aerospace is pioneering the use of Agile and DevSecOps methods for satellite development.

- **Constellations can be dynamically modeled as digital twins.** With Prairie, acquisition professionals will be able to set key requirements, conduct trade studies to ensure system resiliency under contested conditions, and collaborate with space operators, industry and warfighters.

- **Mission planners can map trajectory and orbits for future space exploration.** Prairie draws upon Aerospace expertise in trajectory analysis and optimization to visualize exotic orbits for future missions and make rapid trades to accelerate the process of detailed mission planning.

- **Developers can rapidly create and test new capabilities with Space DevOps.** Similar to agile software processes, developers will be able to introduce and assess changes to system software side-by-side with users. Upgrades will be integrated and evaluated with Prairie-controlled hardware testbeds and emulators, and rapidly tested on-orbit with a fleet of DevOps satellites operated from Prairie. Data from every mission is retained for training and to determine potential opportunities for augmented artificial intelligence (AI).

- **Prairie is next-generation capable.** Prairie's gaming engine will be able to evaluate where AI can deliver an asymmetric advantage over non-AI counterparts in satellite operations. All user actions are recorded for use as training data for AI agents to mimic and anticipate behaviors.
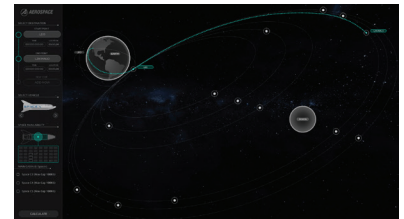
Constellations. Complex constellations, orbits, and trajectories are readily visualized in Prairie. This makes it easier for users to gain awareness of what's happening.
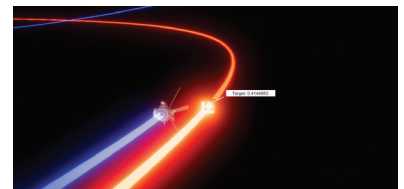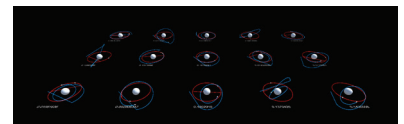
Integrating Next-Gen Technologies. Prairie will allow users to simulate new technologies, such as AI or space robotics, to gain a better understanding of how they will add mission value well before satellites are launched into space.

Case Study: Simulating Satellite ISR for a Multi-National, Live-Fire Wargame

Prairie was used to provide the space simulator for a live-fire, multi-nation wargame. This included mission planning and tasking of satellite ISR (Intelligence, Surveillance, and Reconnaissance) imagery. Prairie's mission planning features were leveraged to identify available commercial and government satellites that would have a view of the target site. Aerospace was able to quickly adapt Prairie to the users needs, replacing the "white card" they had planned on using to represent space with an interactive experience.

Supporting Live-Fire Wargaming Execises. Prairie's mission planning and ISR visualization tools have already been used to provide the space layer for a live-fire, multi-nation wargaming exercise.

The Aerospace Corporation

The Aerospace Corporation is a national nonprofit corporation that operates a federally funded research and development center and has approximately 4,000 employees. With major locations in El Segundo, Calif., Albuquerque, N.M., Colorado Springs, Colo., and the Washington, D.C., region, Aerospace addresses complex problems across the space enterprise and other areas of national significance through agility, innovation, and objective technical leadership.