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Multi-Mode Multi-Purpose Transportation Vehicle (M3PTV)

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Abstract: *The Multi-Mode, Multi-Purpose Transportation Vehicle (M3PTV) is an innovative hybrid platform designed to operate efficiently in both aerial and ground modes, addressing the limitations of conventional single-domain unmanned systems. By integrating UAV capabilities with ground mobility mechanisms such as caterpillar tracks, the M3PTV offers enhanced versatility for operations in defense, agriculture, surveillance, and disaster response. It is engineered to navigate diverse terrains and function effectively in adverse weather conditions while maintaining low visibility and energy consumption during ground operations. The platform is equipped with essential components such as a flight controller, GPS, IMU, altimeter, camera system, and a fire detector, making it capable of real-time data collection and autonomous navigation. Designed around the X-configuration for optimal stability and performance, this cost-effective and low-maintenance system provides a reliable alternative in areas where flying is restricted or unsafe. With its dual-domain operation and modular architecture, the M3PTV stands as a future-ready solution to meet the growing demands for adaptable and resilient unmanned vehicles across multiple sectors.*

Keywords: Hybrid Vehicle, UAV-UGV Integration, Surveillance, Dual-Mode Mobility, Autonomous Navigation

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