Nova Systems

Why Digital Mission Engineering?

(DME) represents a transformative approach to the design, development, and optimisation of complex mission systems employed in military missions. Departing from conventional capability development practices, DME harnesses advanced modelling and simulation tools, and data-centric methodologies to facilitate experimentation at both the system level, and system of systems level.

Simulating your high-value assets; aircraft, missiles, ships, tanks, radar, satellites & radar communications networks, using digital modelling allows you to:

- Analyse the performance of your assets.
- Incorporate physical environments in situ.
- Evaluate your operational effectiveness of systems against your mission goals at every phase of your capability life cycle.

How Systems Tool Kit (STK) can help you

Systems Tool Kit (STK) can simulate and iterate multiple modelling scenarios rapidly, resulting in significant cost savings when compared to operationalising real assets. STK is widely recognised as the most accurate and trusted mission planning and replay tool, utilised by the US Department of Defence.

Nova Systems understands that the Joint Capabilities Group (JCG) undertakes Joint Collective Training to support the success of their real-world operations. Constructive Modelling & Simulation (CM&S) is recognised as one of the four key pillars.

CM&S is the first phase of creating the modelled scenario before moving into the Live and Constructive Training Virtual Simulators, then progressing to Live/ Range and in theatre Command and Control activities.

STK stands out by offering a single unified modelling and simulation platform which is validated and capable of modelling all domains.

STK facilitates time, cost and productivity savings enabling accurate mission planning and post mission analysis. Maximise risk mitigation and exponentially increase mission confidence.

STK can be used for:

Mission Planning

Post mission analysis

Test and Evaluation

Concept creation and visualisation

Benefits of STK

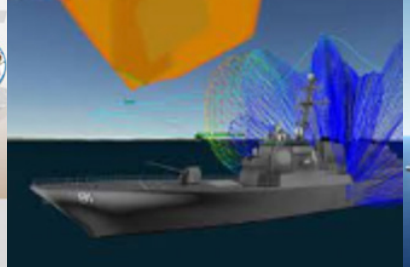
STK is a mature turnkey multi physics-based engine providing an immersive environment that allows users to build, visualise, study and comprehend the performance of complex systems. It allows users to:

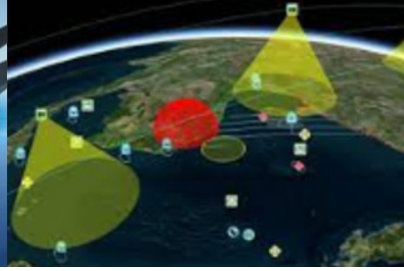
- Assess system performance, identify bottlenecks, and improve efficiency using in built algorithms and optimisation tools. Enabling users to fine-tune designs, allocate resources dynamically, and ensure optimal operation of their systems.
- Model and simulate a wide range of systems, from individual components to large-scale multi-domain systems of systems.
- Build, or import precise models of ground, sea, air, and space assets and combine them to represent existing or proposed systems to obtain a clearer understanding of its behaviour and mission performance.
- Develop digital twin models to experiment and obtain a clearer understanding of future behaviours and mission performance by altering simulated variables within the model to test various hypotheses.
- Gain deep insights into system behaviour and interactions.
- Access seamless integration and interoperability with other tools and systems.

STK can interface with other industry-standard software, allowing users to incorporate data from various sources and existing infrastructure and offers rich 2D & 3D visualisations in time-dynamic environments.

- STK's Open Architecture principles is designed to accept external data common tools that you use such as: MATLAB, Python, Excel, Esri, Satellite data, ASTOS, data from even hardware placed in simulation loop (HIL) and more. Execute SysML behaviour models from Cameo into STK's mission environment. Streamline workflows to support test and evaluation efforts across multi-domain platforms and systems.
- STK includes various resolution global terrain data sets, 10-meter resolution global Sentinel-2 imagery, and 3D models in standard formats.
- Interoperability promotes compatibility and cross collaboration with other Defence products.
- STK supports Model Based Systems Engineering (MBSE) best practice, streamlining the engineering workflow, saving time and resources, and promoting collaborative efforts among teams.

The smarts behind the solution.



Product	Description	STK Pro	STK Premium Space	STK Premium Air	STK Enterprise
STK Pro	Foundation modelling and simulation for aerospace and defence mission engineering and system analysis	X	X	X	X
STK Integration	Enables direct integration and automation of STK with other software applications (MATLAB/Python etc)	X	X	X	X
STK Analysis Workbench	Enables users to create custom functions and calculations relative to times, positions and reference frames in STK	X	X	X	X
STK Coverage	Analyse and visualise your system performance anywhere in a user defined coverage grid	X	X	X	X
STK Comm/Radar	Adds RF and Optical communications and radar systems to your STK modelling and analysis	X	X	X	X
STK TIREM	Enables calculation of RF propagation losses over regular terrain and seawater, including non-line of sight effects	X	X	X	X
STK Urban Propagation	Enables diffracted path loss analysis in urban environments	X	X	X	X
STK Engine +1 Runtime	A software development kit (SDK) that enables custom STK application development and 1 deployment license (for internal use)	X	X	X	X
STK Analyser / Optimiser	Adds the capabilities of Model Centre to STK, enabling advanced, automated trade studies and parametric analyses		X		X
STK Parallel Computing	Scale calculations from 8 (default) to 16 cores to increase compute performance for resource intensive applications of STK		X		X
STK EOIR	Adds EOIR sensor performance modelling to STK		X		X
STK Real Time Tracking Technology (RT3)	Display and analyse real time data feeds in STK		X		X
STK Distributed Simulation (DISM)	IEEE compliant DISM and HLA interfaces for STK		X		X
STK Astrogator	Adds advanced spacecraft trajectory modelling and manoeuver planning capabilities to STK		X		X
STK SatPro	Adds advanced orbit modelling tools for satellite mission design and operation		X		X
STK Conjunction Analysis Tool (CAT)	Enables rapid identification and analysis of space object conjunctions		X		X
STK Space Environment Effects Tool (SEET)	Adds space environment variables (radiation, charged particles, thermal etc) to your orbit modelling and analysis		X		X
STK Aviator	Adds advanced aircraft performance and propulsion models, manouever profiles, and flight procedures to STK			X	X
STK Aviator Pro	Extends STK Aviator by adding advanced manoeuvers that dynamically respond to other aircraft, enabling air combat simulation			X	X
Behavioural Execution Engine aka Moxie	BEE / Moxie uniquely facilitates execution of SysML behavioural models in the mission environment				X
STK Data Federate (SDF)	A web based, enterprise Content Management System (CMS) for STK				X
Test & Evaluation Tool Kit (TETK)	Improve the efficiency and effectiveness of test and evaluation activities across the digital engineering product lifecycle				X

For More information, please contact:

Garry Farmer
National Sales Lead
E: Garry.Farmer@novasystems.com **W:** novasystems.com/au/stk

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