



How Dstl has used wargaming and simulation in maritime analysis

DSTL/CP158532

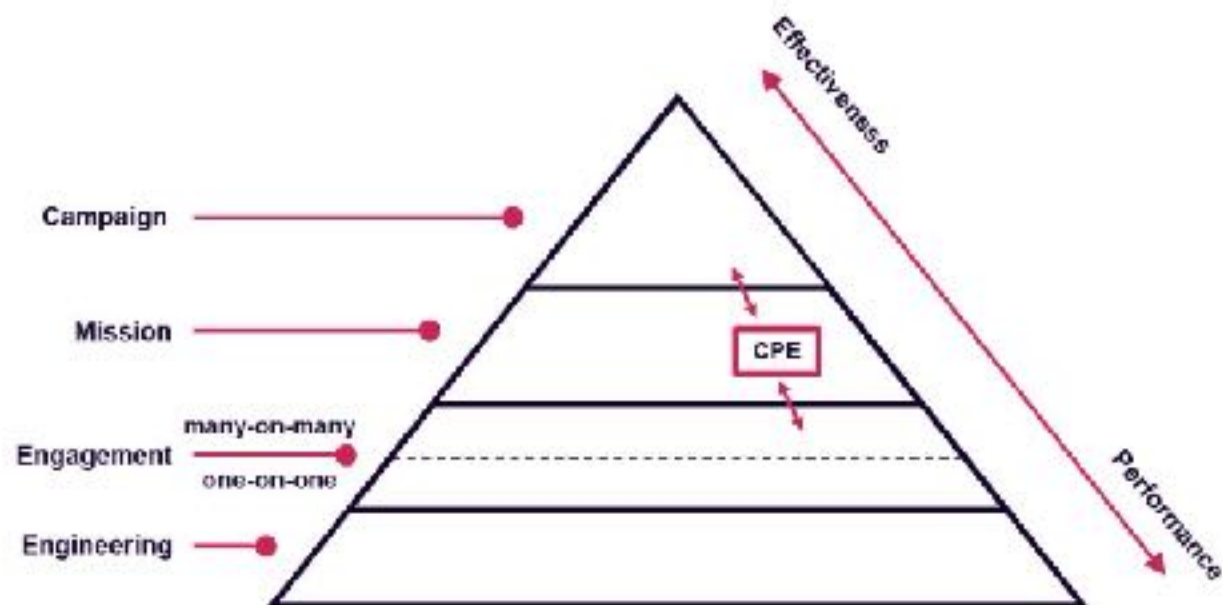
- Dstl are scientists, engineers, and analysts who, supported by our enabling business units, deliver:
 - credible, impartial, evidence-driven advice and solutions enhancing UK defence and security; and
 - science and technology ideas for mutual benefit, working with over 40 nations and second only to USA in contribution to FVEY collaboration.
- Dstl are part of the UK MOD-wide community of Command Professional Edition users.

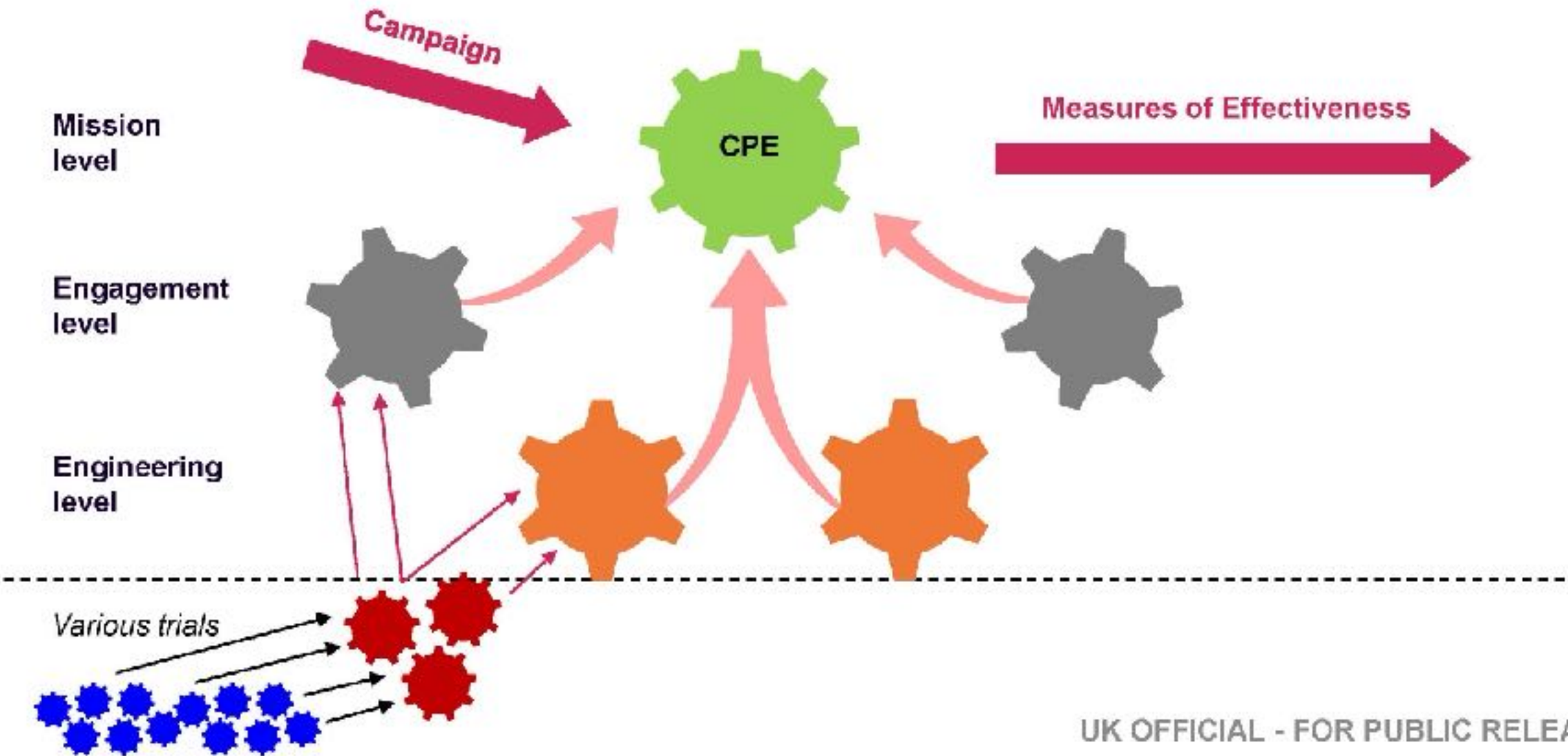


Dstl Portsmouth West
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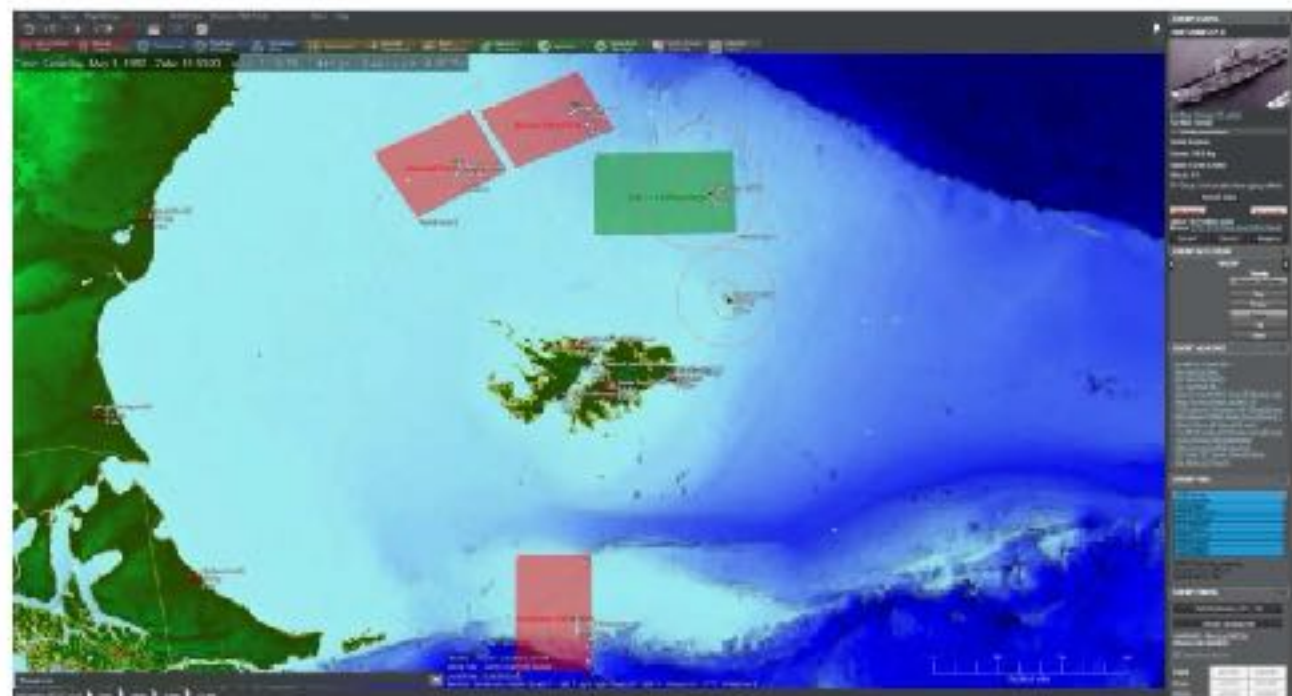
- Navy Force Design Operational Analysis is a study that will deliver comparative assessments of whole force mix options to support Royal Navy decisions.
- Dstl has organised a series of war games with Navy Develop, supported by the captains of warships, their personnel, and those charged with procuring the future fleet, to inform narratives that we now explore in Command Professional Edition.
- We used Command Professional Edition to understand the relative effectiveness of different force mixes across the spectrum of defence tasks, from persistent engagement, crisis response, and warfighting.

- Dstl use Command Professional Edition as a mission-level model to assess the relative effectiveness of:
 - force structures;
 - force dispositions; and
 - capabilities.
- We exploit some of our models to supplement Command Professional Edition.
- Dstl has built a tool to read in SURVIVE / Purple Fire outputs to improve damage modelling of specific platforms versus threats and SADM inputs to improve specific missile engagement events.





- Dstl analysed conceptual air defence and littoral strike options for maritime task groups.
- We tested concepts against threat-endorsed scenarios. Our analysis identified the relative effectiveness of some options against others, and factors that were common across concepts.
- Some 20 vignettes have been modelled.
- Our measures of effectiveness are used to:
 - inform business case submissions;
 - understand task group survivability; and
 - inform the future direction for the Royal Navy to engage land and maritime surface targets.



"Fleet Action" in Falklands Campaign in Command Professional Edition.



'DragonFire' Laser Directed Energy Weapon (LDEW), seen here on display during a media facility at Dstl Porton Down in Salisbury, UK. UK MOD Crown copyright 2024.

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- Dstl is investigating the potential operational effectiveness of different air defence solutions, including different numbers of ships and different effector outfits on those ships.
- Our work was informed by a series of military judgement panels to understand anticipated weapon expenditure and force laydown, which was implemented in Command Professional Edition.
- We modelled the options against a 2-week deployment, consisting of a series of different vignettes at differing levels of conflict and threat. Included both carrier strike group missions, and smaller scale missions.

- The Multi Role Support Ship (MRSS) is a concept phase programme in Navy Develop to provide expeditionary naval presence and littoral strike capability to replace current platforms in the early 2030s.
- During the pre-concept phase, Dstl assessed the force level survivability of MRSS operating in littoral response groups.
- We used Command Professional Edition to assess MRSS against a range of threats; mixes of organic and escort defence; and variations in the formation design.
- The work justified some candidate key user requirements.



HMS Albion takes part in the Dutch Marine Days festival, commemorating the UK NL Amphibious Force 50th anniversary. UK MOD Crown copyright 2023.

- All-arms antisubmarine warfare
 - The UK has brought together the all-arms antisubmarine warfare community to run advanced multi-layered scenarios.
 - Using Command Professional Edition as the visualisation tool has helped to further develop the UK all-arms antisubmarine warfare ethos and has proven to be a solid networking tool across UK all-arms antisubmarine warfare.
 - The Operational Advantage Centre have now demonstrated this capability independent of Dstl.



HMS Portland sailing from Plymouth.
UK MOD Crown copyright 2024



RAF Poseidon dropping an exercise torpedo.
UK MOD Crown copyright 2021



An Astute-class submarine transiting surfaced.
UK MOD Crown copyright 2024

- Strategic Command's Deputy Commander, Lieutenant General Tom Copinger-Symes, has formally opened the Defence Experimentation and Wargaming Hub. The facility, developed in partnership with the Dstl, will be the centre for experimentation and wargaming in Defence.
- The Strategic Command Wargaming Hub at Southwick Park are going to use Command Professional Edition as a tool for wargaming, including double-blind wargames.
- The Joint Warfare Development Branch are conducting a trial to assess the utility of Command Professional Edition as an operational tool for analysis, education, and training.

"The hub will be the epicentre for strategic brilliance and tactical innovation, and will enable evidence-based decisions to be made at an increased pace."



Lieutenant General Tom Copinger-Symes.
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[dstl] The Science Inside

Discover more





**MATRIX
PRO SIMS**

COMMAND

PROFESSIONAL EDITION



How DSTL Use has Used Wargaming & Simulation in Maritime Analysis
Presented by Iain McNeil – Matrix Pro Sims
Jamie Etherton – DSTL

INTRODUCTION

01

We work with major license holders like the History Channel, Sony Pictures (Starship Troopers), Universal Studios (Battlestar Galactica), Games Workshop under the Slitherine brand

02

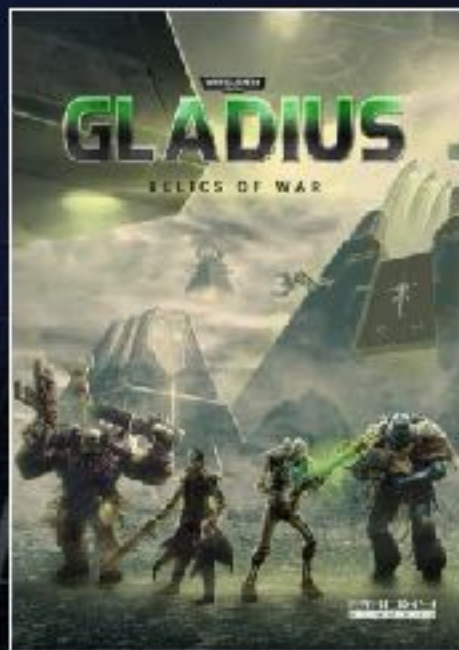
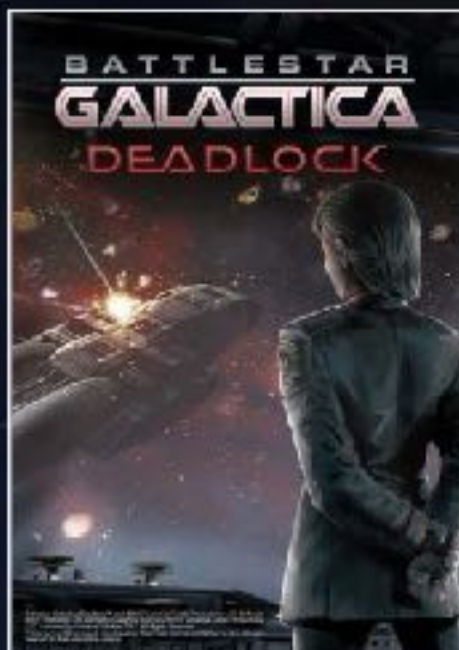
Matrix is the undisputed world-leading publisher of digital wargames.

03

With development teams across the world including the US, UK, Canada, France, Italy, Australia and more, it has a very specialist focus on highly detailed turn-based strategy videogames.

04

Matrix manages a range of products that span every historical period and scale, from tactical to high-level operational and even strategic.



PROFESSIONAL PRODUCT LINE



Combat Mission

- Tactical ground combat
- Realistic physics and behaviour modelling
- Full 3D
- Realtime or turn-based execution

Multi-domain physics based battlespace for air, sea, land, sub surface, space and cyber

Database of the world's frontline Air and Maritime equipment from 1946 to near future (editable!)

Connect via DIS and Lua scripting

Monte Carlo analysis

Command



Flashpoint Campaigns

Brigade-level ground combat

Effects-based top down model

OODA loop system

Realistic physics

PROFESSIONAL CLIENTS

23 nations, 150+ clients, 3000+ users



USAF Air Mobility Command uses Command for fuel planning, replacing spreadsheets planning tools where it was impossible to simulate the effects of enemy action on fuel planning



Luftwaffe

The German Air Force trains all new Air Force officers using Command to bring Air Power concepts to life and transforming their education from a slide-based approach, to an interactive one.



US Air Force Research Laboratory uses Command for its physics-basis in innovation and research, showing both expected and emergent behaviours.

Command is the reference simulation in AFRL's "AI for Command" Challenge



Marine Corps Warfighting Lab uses Command for future force analysis.

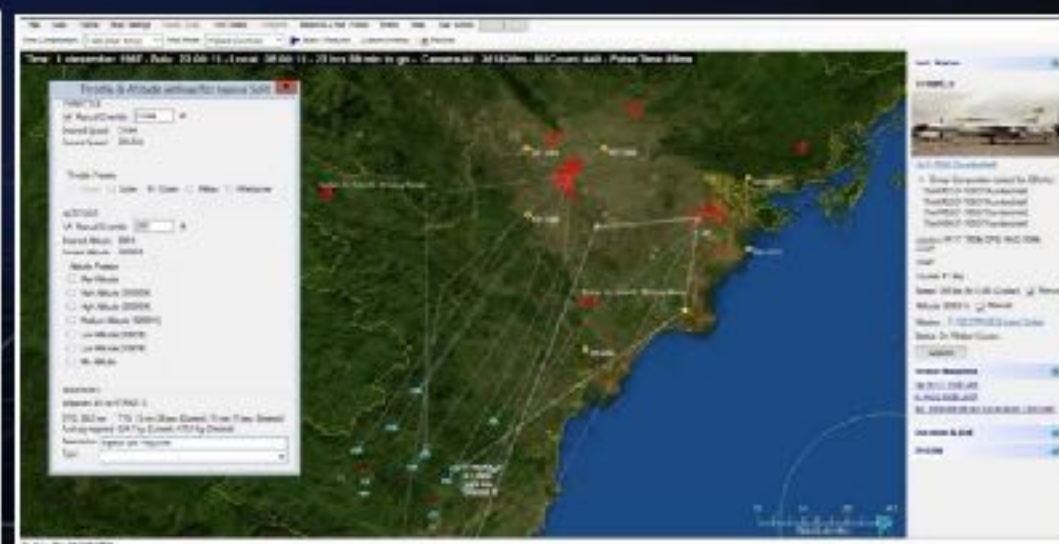
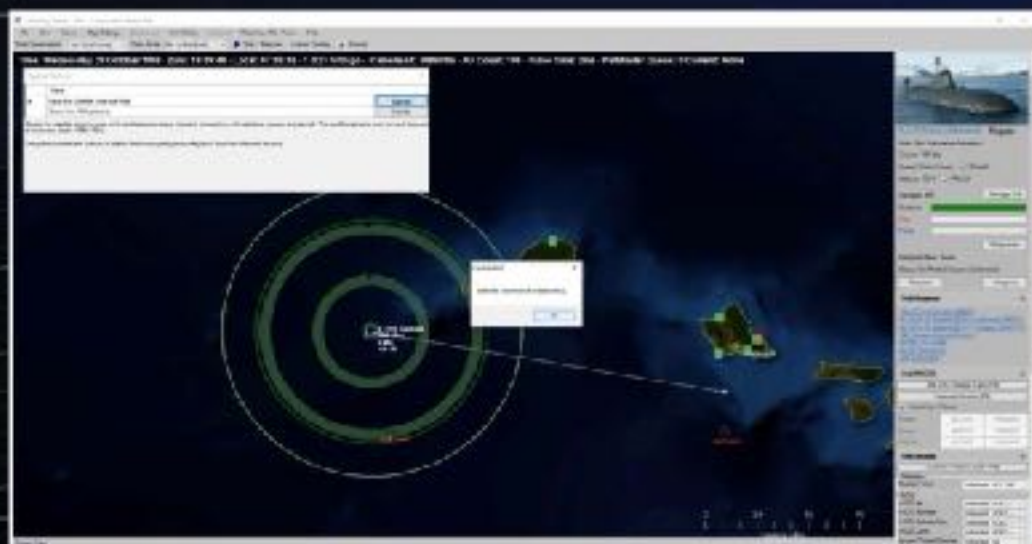
Marine Corps University's CSC and SAW schools use Command and other COTS for wargaming and student capstone events





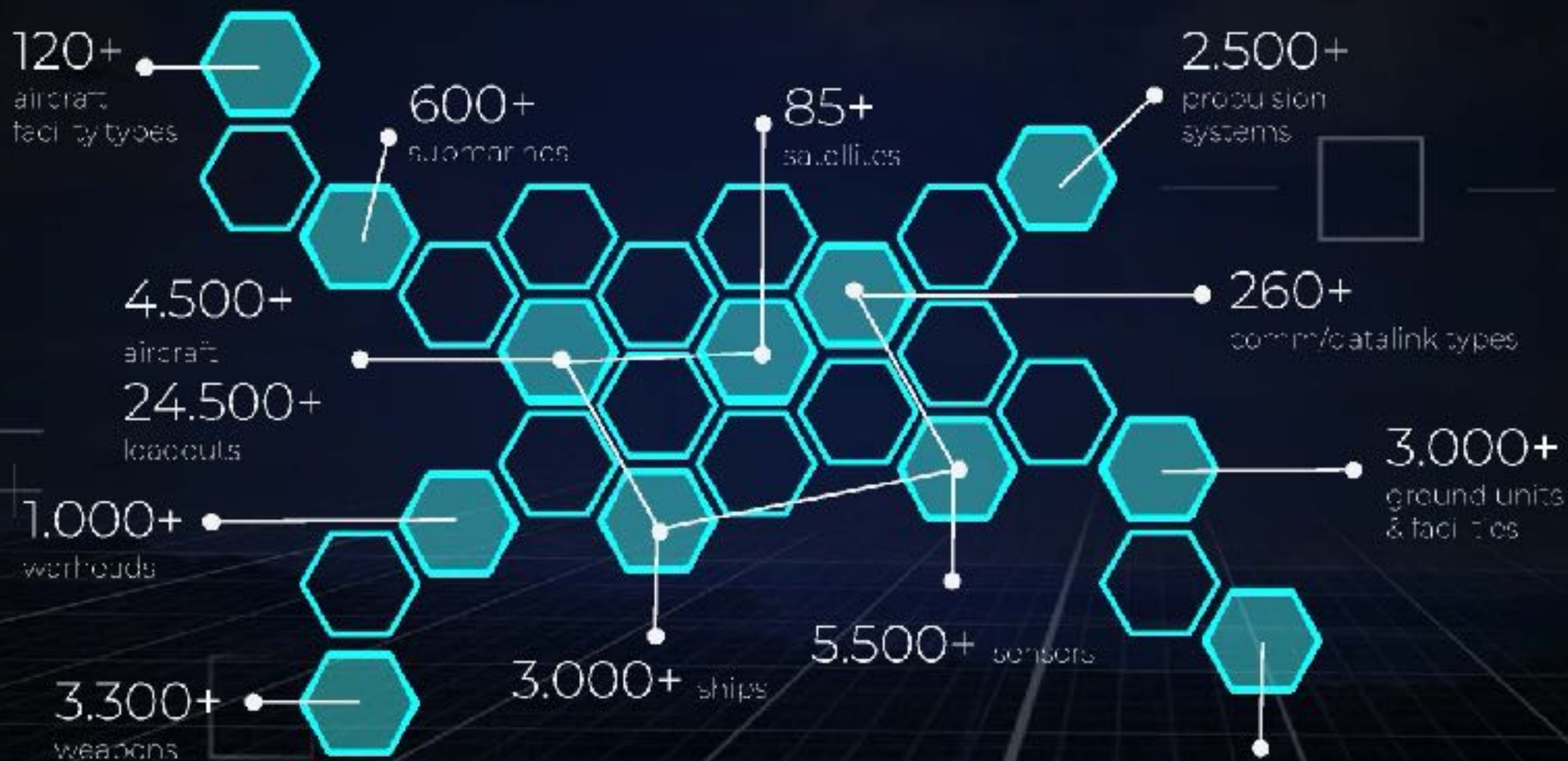
COMMAND – WHOLE EARTH CROSS DOMAIN

SATELLITE
10/10



FULL DATABASE EDITOR

SATELLITE
VIEW



all at your fingertips

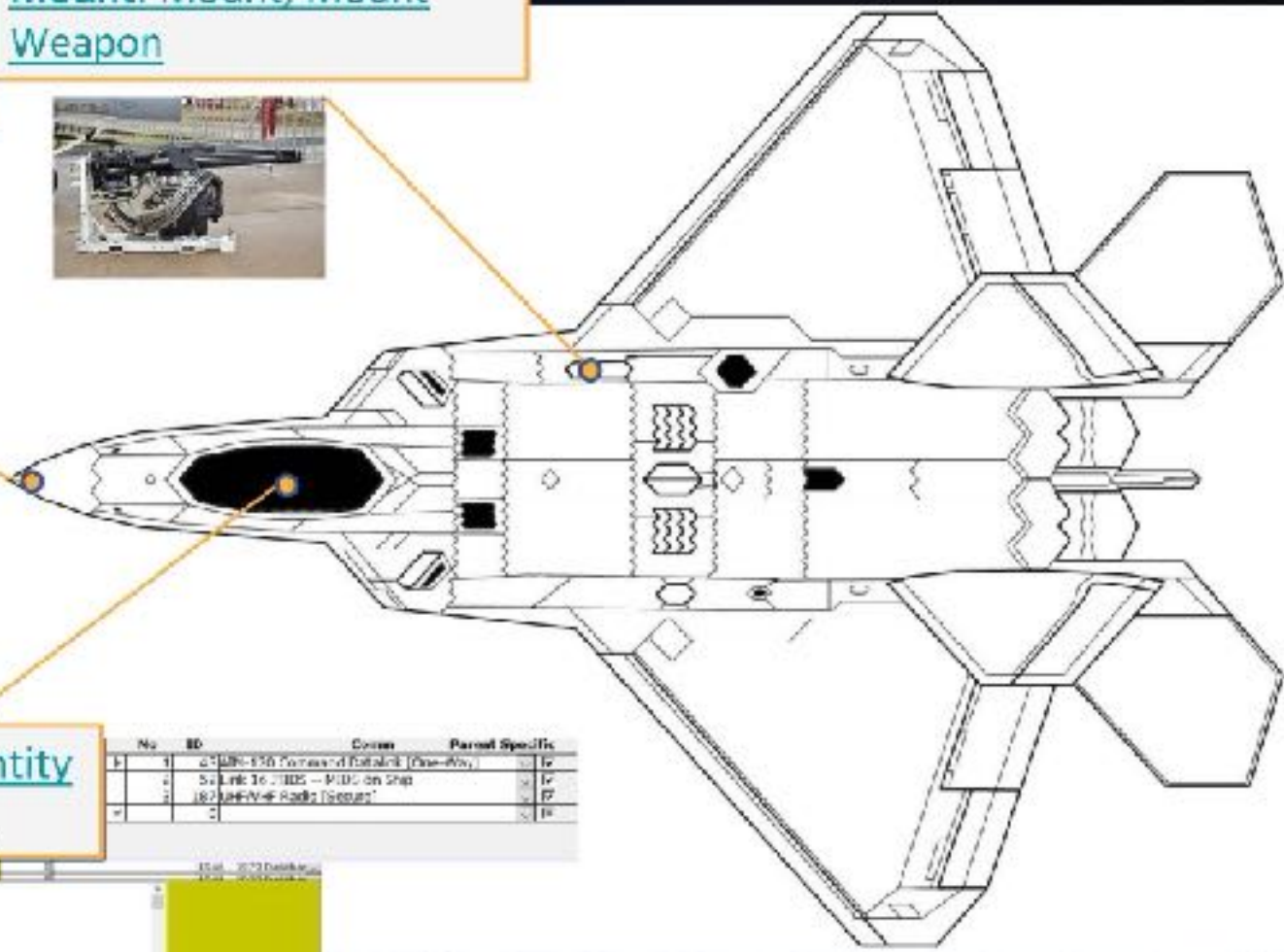
F-22A RAPTOR PARTIAL ENTITY BREAKDOWN



M61A2 Vulcan Cannon
Mount: Mount, Mount
Weapon



AN/APG-77(V)1
Sensor: AESA Radar
AN/ALR-94
Sensor: ELINT - ESM



Comms: 1 Radio Entity
2 Datalink Entities

No	ID	Comms	Parent Specific
1	1	01 AN/APG-77(V)1 AESA Radar (One-Way)	16
2	2	50 Link 16 JREDS - MDC on Ship	17
3	3	60 Link 16 JREDS - MDC on Ship	17
4	4	61 Link 16 JREDS - MDC on Ship	17

No	ID	Comms	Parent Specific
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COMMAND EDITOR

SATELLITE
VIEW

The screenshot shows the Command Editor interface. At the top, there's a toolbar with various icons. Below it, a status bar displays: "Time: Sunday, May 16, 2021 - Zulu: 18:05:19 - Local: 20:05:19 - 1 c to go - Camera Alt: 1667m". The main view is a satellite map of an airport with a white aircraft icon. A "Add new unit" dialog box is open in the center, showing a list of units with columns for Name, Country, Year, and Unit. The units listed include various aircraft models from different countries and years. On the right side, there's a "UNIT DISPLAY" panel with a camera view of a unit, a "Building (airfield)" section with a "Unit storage log" button, and a "UNIT ROSTER" section with buttons for "GADCO Window (C) + (F)", "Device Window (F)", and "Destroy window (C) + (F)". Below the roster, there's a "Status" section with buttons for "ACTIVE" and "PASSIVE" for "Unit", "Scale", and "Status".

Name	Country	Year	Unit
A-10A Thunderbolt II	United States (USA)	1971	100
A-10C Thunderbolt II	United States (USA)	1998	100
A-10C Thunderbolt II	United States (USA)	1998	100
A-10C Thunderbolt II	United States (USA)	1978	100
A-10C Thunderbolt II	France	2014	0
A-10C Thunderbolt II	Germany (FRG)	1978	0
A-10C Thunderbolt II	Belgium	2008	0
A-10C Thunderbolt II	Spain	0	0
A-10C Thunderbolt II	Turkey	2018	0
A-10C Thunderbolt II	United States	1998	0
A-10C Thunderbolt II	United States	2000	0
A-10C Thunderbolt II	United States	2000	0
A-10C Thunderbolt II	United States	2000	0
A-10C Thunderbolt II	United States	2004	0

Full world geography – create a scenario anywhere in the world.

Every nation in the world represented.

Equipment from every nation included.

Build & test scenarios in minutes not days or weeks.

LUA SCRIPTING & PLUGIN API

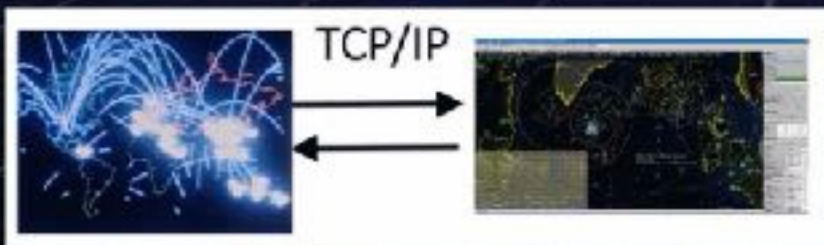
Go beyond the graphical interface

Built-in Lua console provides direct access to the internals of the running simulation



TCP/IP socket access to Lua API – remote-control Command from any external console or application

Script commands can be either human- or machine-driven (HAL or WOPR/Joshua as adversary!)



Lua I/O (optional) – use any of Lua's built-in input/output abilities to facilitate information import & export



CONTACT

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Or visit:

www.matrixprosims.com

Presented by **Iain McNeil**

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