

## VEHICLE MISSION SYSTEMS



# MISSION SYSTEM. OPERATIONAL NEED.

## VEHICLE LIFECYCLES

The development lifecycles of military vehicles have become protracted, strongly delineated and often user specific.

Commonly executed by a single prime contractor, programmes can suffer from over-complexity caused in part by efforts to design for all anticipated mission roles. Agility and freedom of action are inevitably compromised.



## THREAT EVOLUTION

Threats are evolving at an increasing rate, particularly those exploiting increasingly affordable and widely available commercial technologies.

These threats include:

- Information Technology
- Low-Cost Sensors
- Robotic Vehicles
- Communication Systems

Unless each vehicle lifecycle can adapt to these rapidly changing threats and associated mission environments, it may be impossible to achieve mission readiness.

## MISSION LIFECYCLES

A new acquisition model involves decoupling of the procurement and support of land Mission Systems from the host vehicle.

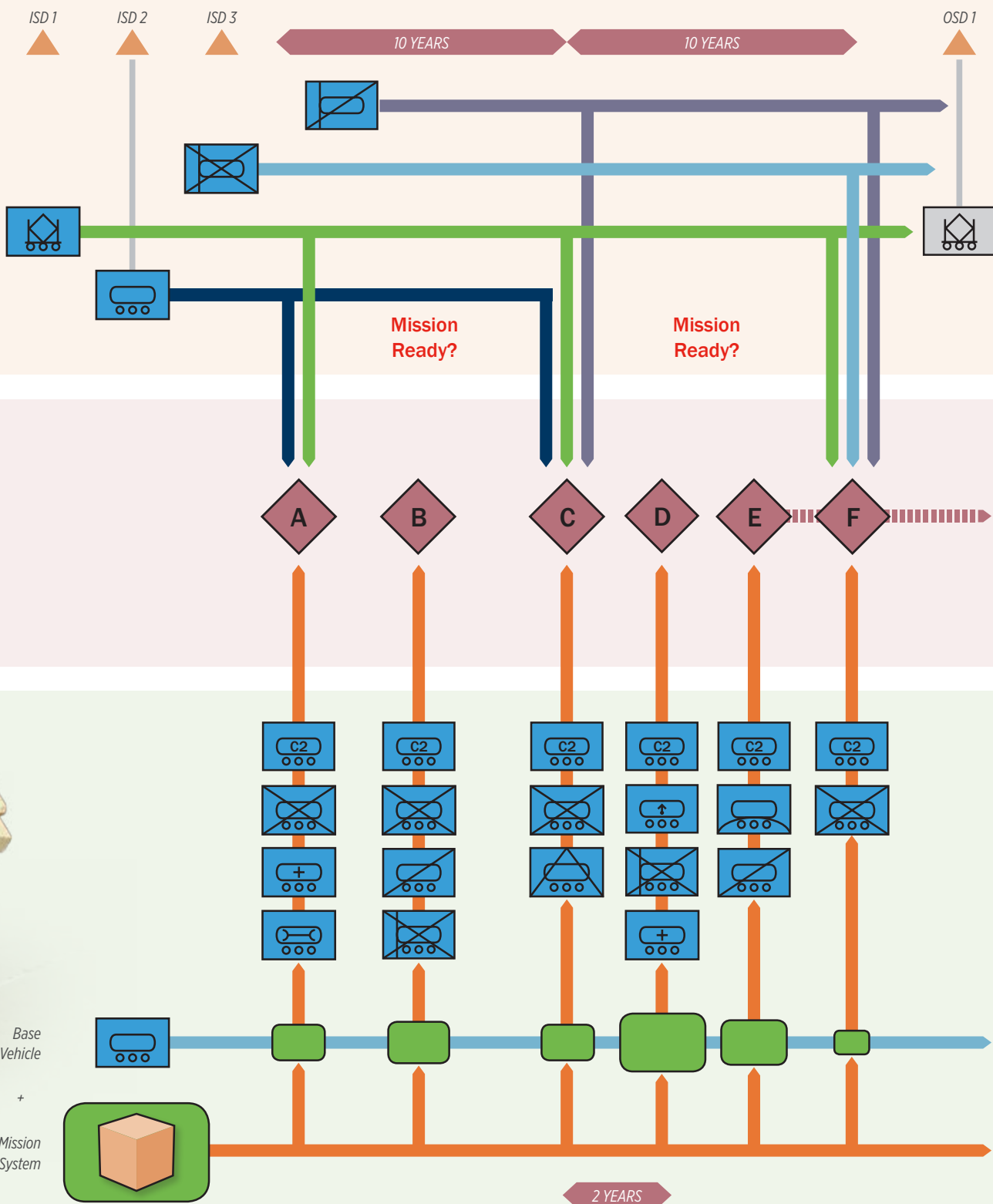
To be successful, this requires:

- Clarity of definition of Mission System architectural context
- Precise standardisation of selected interfaces
- New contracting models

The 'Generic Vehicle Architecture' (GVA) approach is the de facto standardisation initiative that is enabling this 'Mission Lifecycle' approach.



DECOUP



PLING MISSION SYSTEMS FROM BASE VEHICLE PROCUREMENT.



# MISSION SYSTEM. THE SOLUTION.



Long Range  
IR Detector



Remote Weapon  
Subsystems



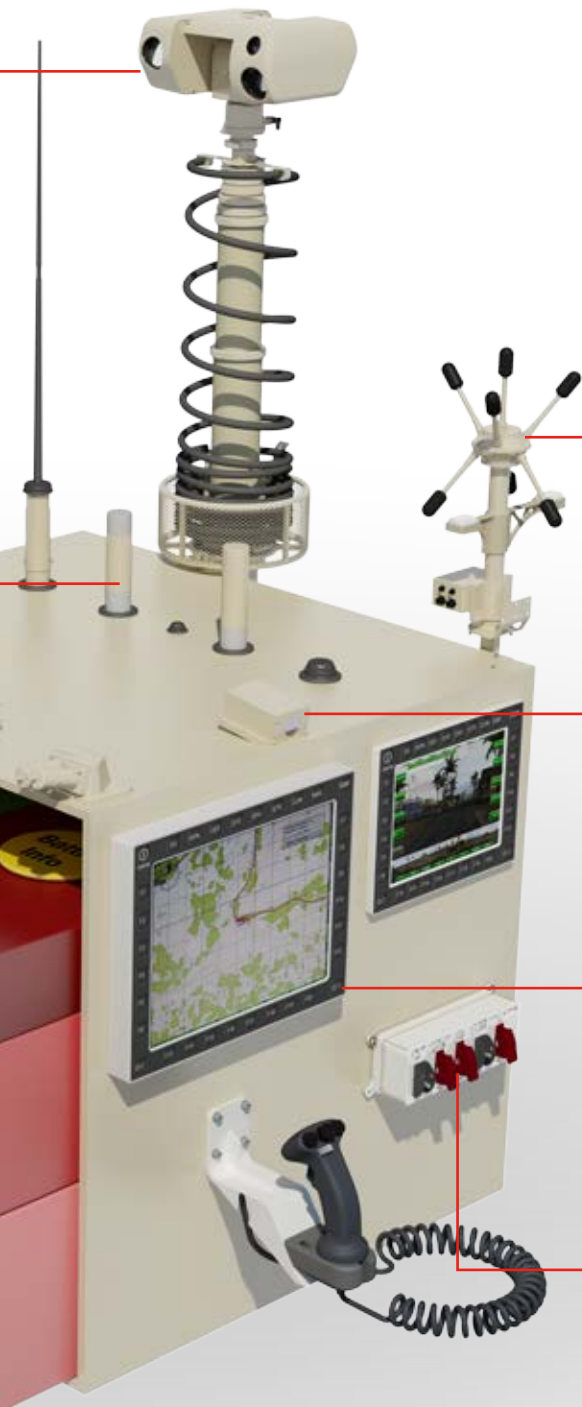
Defensive  
Aids



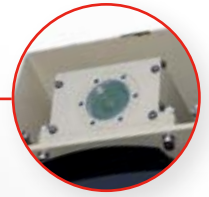
Driver's Night  
Vision



# A VEHICLE-AGNOSTIC MODULAR GVA APPROACH TO MEET FUTURE MISSION NEEDS.



Sniper  
Detection System



Situational  
Awareness Camera



GVA 'RD-Series'  
Displays



Hard Control  
Panel

A Mission System following the GVA approach offers a configurable, scalable suite consisting of:

- Sensors
- Effectors
- Processing and data storage
- Communications
- HMI modules

These are interconnected via one or more local Ethernet networks, while power requirements are managed through standard military connection points. The software is modular and decoupled from the hardware by a middleware layer. This enables mission-appropriate applications to be installed and/or tailored to the specific operational need.

The GVA common user interface is used for on-board operation of all subsystems, from any crew station. It reduces the clutter inherent with multiple dedicated devices in a typically cramped workspace and helps towards more economic cross-fleet user training.

Working in collaboration with the base vehicle provider, the company offers a whole-life Mission System solution - from concept through to acquisition, training and support.



# MISSION SYSTEM. EXPERTISE AND FACILITIES.

The configurable modular re-use concept behind GVA demands more than just an 'installer'. A Mission System Integrator must be appointed, capable of applying specialist and inter-disciplinary system engineering, management and support skills.

The company's Vehicle Mission Systems benefit from a long-established pedigree of supply to the British Army including Challenger 2, Panther, Terrier, Mastiff, Ridgback, Wolfhound, Viking and Warrior. This provides a proven understanding of the factors affecting capability and affordability, which can be balanced in a land context.

An in-house team of Mission System experts proactively supports the development and maintenance of the GVA defence standards. Continued investment in engineering facilities ensures the availability of the breadth and depth of skills necessary to deliver and support integrated, mission-ready solutions.

'Interoperability' is a frequently used term, reflecting a reasonable user expectation. The multi-layered aspects of delivering interoperability in complex military systems are embedded in the company's core business.



## VEHICLE READY

Host vehicles inevitably place many physical constraints on the Mission System and crew. 3D CAD tools are used alongside an extensive model library to allow these concerns to be addressed early in the Mission System lifecycle.

The installation and placement of external sensors and effectors are optimised for maximum utility and performance. Informed decisions are made on the electronic infrastructure topology and the degree of modular re-configurability that a vehicle can support.

## CREW READY

A 3D Immersive Virtual Reality suite is used before manufacture to explore:

- Ergonomics of the crew interface
- Installed performance
- Safety aspects

Concepts are validated and geometries are optimised to ensure operational effectiveness, crew ingress and egress, equipment access and maintainability.

## EMC READY

A specialist in-house RF modelling capability is used to inform EMC and optimise performance. This is particularly relevant to GVA Mission Systems where digital infrastructures must interoperate with C4I and/or ECM subsystems in close proximity and within an ever more crowded EM spectrum. Safety hazards of 'head out' operation are understood and mitigated through our radiation field strength modelling.

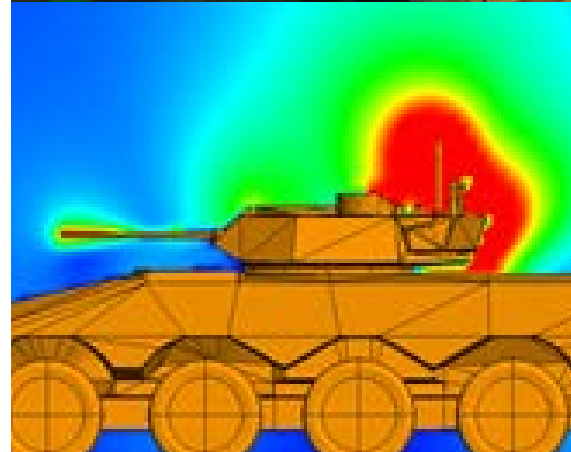
A separate part of the company also provides expertise to inform the Information Security aspects of interoperability.

## FUNCTIONALLY READY

The GVA System Integration Lab (SIL) facility uses the GVA standard network and middleware infrastructure throughout. Mission Equipment and Software elements are integrated and complex system behaviour developed and verified before vehicle installation.

Using data from the Synthetic Environment tools over the GVA network, real-time information exchanges including full motion video and audio are verified. This integrated SIL/Synthetic Environment approach forms the basis of a powerful, accurate and affordable training and mission rehearsal environment.

# MISSION READY.



# CONFIGURABLE CAPABILITY

The configurable approach offers many LRU and software module combinations. GVA requires these module combinations to be organised into functional groups for access at the standard display which may be tailored for each crew member or role.

Our development focuses on typical Mission Needs including:

- Driving Aids
- Vehicle Self Defence
- Mission Planning and Management (C2/3)
- Locating Targets (Mast Mounted Sight STR example)

Other combinations and special-to-role requirements can be accommodated.

Crew			GVA Ready Equipment	Local SA Cameras	Sniper Detection	Countermeasure Effector	RWS	Navigation	Mast Mounted Sight	MOTS Radios	MOTS Processor
GVA Display	GVA Hard Control Panel	Headset									
			Situational Awareness (SA)	●	●			●			
			Weapon (WPN)				●				
			Defensive Aids (DEF)			●					
			System (SYS) (BIT, HUMS, Pwr Mgt, User Config)								
			Driving Aids (DRV)	●				●			
			Communications (COM)							●	
			Battle Management (BMS)					●			●
			Special To Role (STR)					●	●		















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