



BOXER for the Danish Armed Forces – short briefing

ARTEC GmbH

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Executive Summary

- To **replace its aged vehicles**, **Germany and the Netherlands** contracted development and delivery of 472 **BOXER** vehicles
- **BOXER** is a proven solution as its **development is finished**, **series** vehicles are being **delivered** and **BOXER** is **deployed** to **Afghanistan** in increasing numbers and versions
- **BOXER** is a proven solution for a successful mission in terms of **protection**, **payload**, **performance/mobility** and **flexibility**
- **Unique** compared to other vehicles, **BOXER consists** of a (common) **Drive Module** – identical to all versions – **and specific mission Modules**, defining the version of the vehicle
- The inherent flexibility of **BOXER** provides an **unique portfolio of advantages** compared to all other vehicles in terms of
 - Procurement
 - Adaptation and growth and
 - Operation (domestic and theatre)
- **Danish industry** could largely **benefit from BOXER** also due to its unique modularity and involvement of the leading German defence companies – Krauss-Maffei Wegmann, Rheinmetall and MAN



1. Background and status of the German - Netherlands BOXER-Programme

To replace its aged vehicles, Germany and the Netherlands contracted development and delivery of 472 BOXER vehicles



125 Armoured Personnel Carrier
65 Command Post Vehicle
72 Armoured Medical Treatment Vehicle
10 Driver Training Vehicle



60 Command Post Vehicle
52 Ambulance (MedEvac)
27 Cargo Vehicle
53 Engineer Group Vehicle
8 Driver Training Vehicle

→ 472 Vehicles



Initial In-Service Support Package (Spares, Technical Documentation, S&TE, Training Equipment)

Delivery since 2009

The German Army decided to replace its M113 and FUCHS with BOXER, operating alongside LEOPARD 2 and PUMA IFV

German Army combat systems

LEO 2



LEO 2



M113



FUCHS



BOXER



MARDER



PUMA



The NL Army also decided to replace its M577 and YPR support vehicles with BOXER, operating alongside CV-90

The Netherlands Army combat systems

M577
(variant of M113)



YPR-765
(support vehicle)



YPR-765
(infantry vehicle)



BOXER



CV-90



Development is finished, series vehicles are being delivered, BOXER is deployed to Afghanistan – a proven solution

Current status of DE/NL-Programme





- **Development** for common parts and most Mission Modules **finished**
- **Series delivery** according to contract since 9.2009 – 180 vehicles delivered in 4 versions until end 2012
- The **German Army** conducted a trial in **Australia** begin 2010 – preparation for operation in theatre
- Industry conducted a desert trial 2010 in the United Arab Emirates
- **Deployment of BOXER to Afghanistan since summer 2011** – with increasing numbers of vehicles and versions





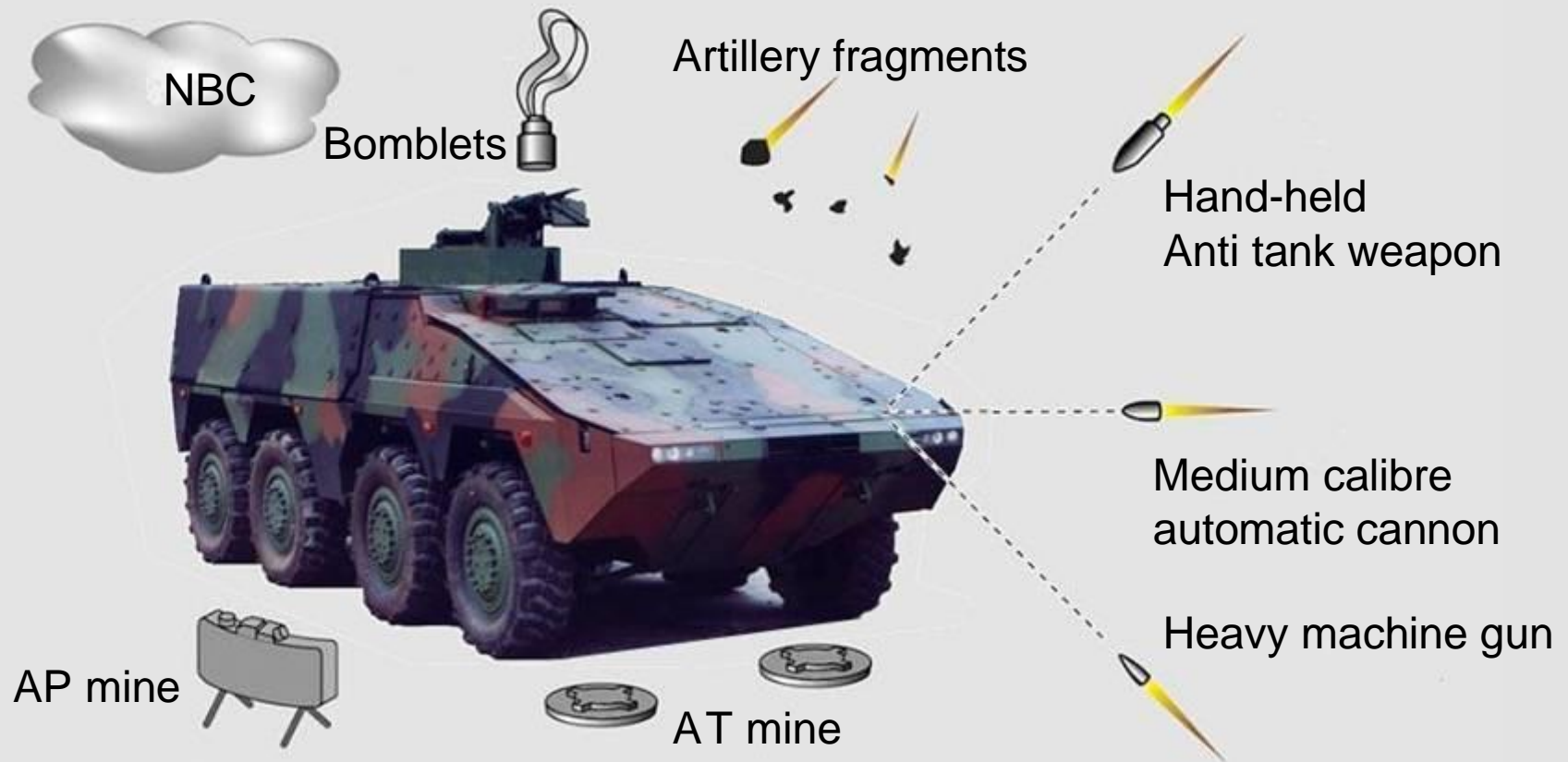
2. BOXER's capabilities

A confident statement: BOXER is the perfect solution for a successful mission, meeting all requirements of Danish Army

	PROTECTION against <ul style="list-style-type: none">• all types of mines• in-/direct ballistic projectiles• detection	PAYLOAD <ul style="list-style-type: none">• 14 - 17.5 m³ of protected volume• Built-in growth potential	
	PERFORMANCE <ul style="list-style-type: none">• Excellent mobility on the road and cross country• High performance power-pack	FLEXIBILITY <ul style="list-style-type: none">• Modular principle of Drive and Mission modules• Easy maintaining• Fit for the future	

Protection – survivability without compromise, meeting all requirements of the Danish Armed Forces and beyond

Scope of possible protection



The protection concept provides an unique flexibility – different protection kits can easily be mounted

Capabilities and Solutions – hull & modular armour



- **Dismounting protection** for training and domestic operation – **reducing wear & tear**
- Mounting of **protection** for vehicles in theatre
- Mounting **special protection kits** for specific vehicles
- **Easy and cost efficient adaptation to new technologies** as only armour plates have to be exchanged

Payload – ready for the future by providing growth potential

- 14 (flat roof) to **17.5 m³** (high-roof) **protected volume** – German APC carries equipment for 10 soldiers for 10 days (!)
- **Growth potential** provided by design
- Payload in total up to 9 t for protection, crew and equipment
- Remarkable payload allows for **customer-tailored solutions**



Performance – proven to operate alongside the LEOPARD 2

- Easy manoeuvrability, maximum speed **>100 km/h** and a range **>1,000 km** on roads
- **Excellent off-road mobility** through
 - Powerful V8 530 KW multi-fuel engine (power-to-weight ratio: 16.1 kW/te – like LEOPARD 2)
 - Permanent all wheel drive
 - Differential locks
 - All-around independent suspension
 - Central Tyre Inflation System
 - Optimal damage protected arrangement of Running Gear and Steering
- Combat wheels with **integrated run flat system** provide the necessary residual mobility in case of puncture



Flexibility – the mission changes, so does BOXER

- BOXER is basically defined by a **Drive Module** and a **Mission Module**
- The concept has been commonly chosen by the UK, Germany and the Netherlands
- The modular principle enables efficient introduction of diverse requirements – change of mission modules <30 min
- Flexibility also down to sub-systems: easy transportability and maintainability in theatre, e.g. exchange of power-pack <20 min

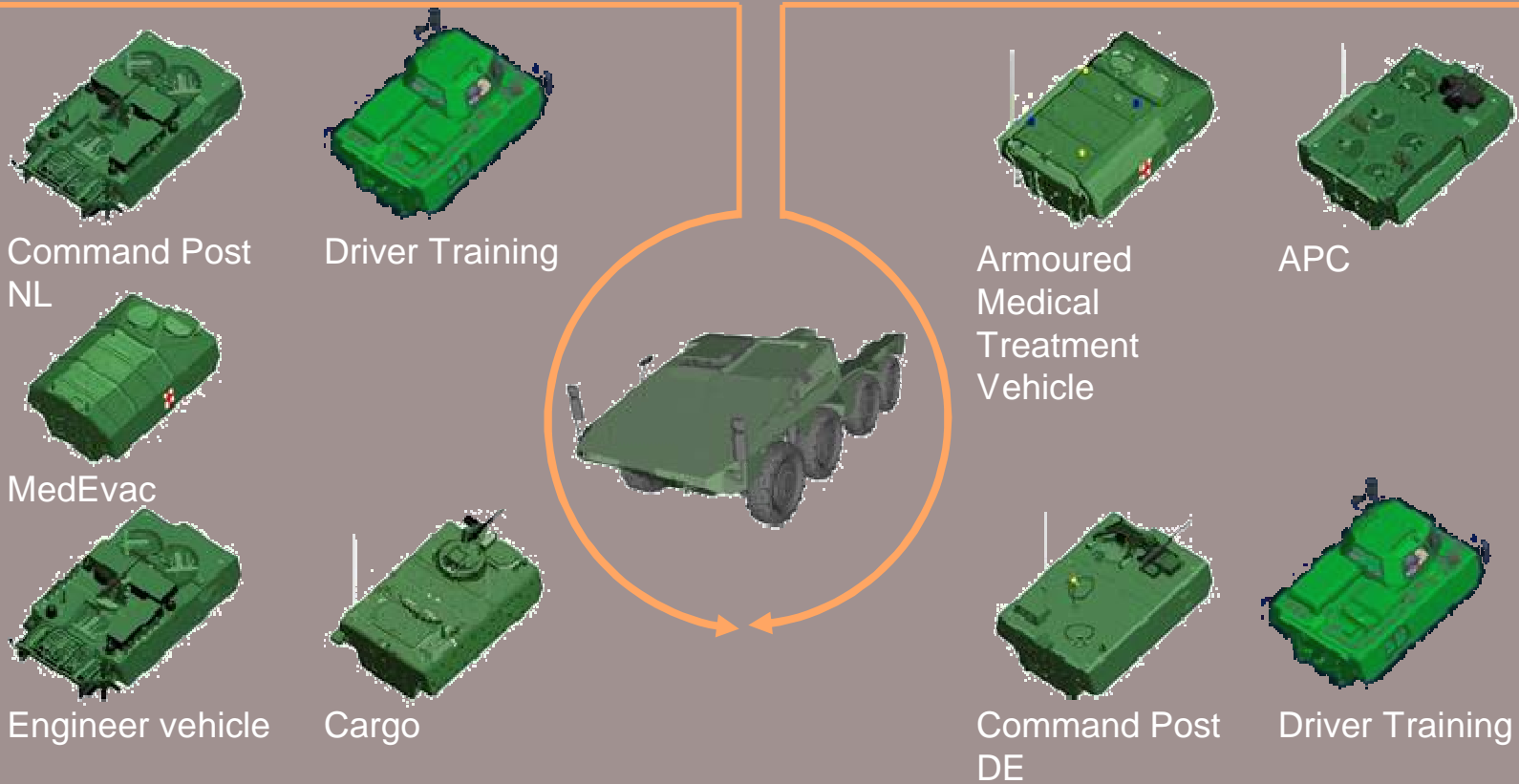


Flexibility in missions – with already eight of Modules, BOXER is capable of various missions in theatre ...

Current Missions Modules

NL-versions

GE-versions



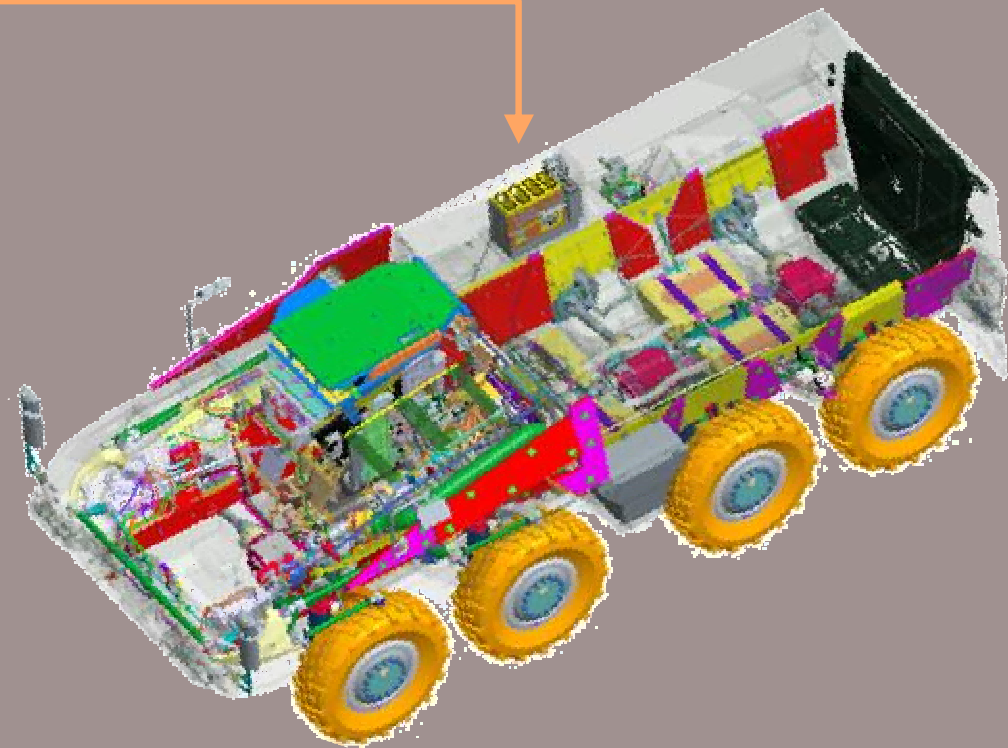
... by relying on a common Drive Module for all national specific versions

Main systems of common Drive Module

Main Basic Vehicle Systems

- Power Pack
- Running Gear
- Hull Drive Module
- Protection
- Fuel System
- Electrics (CAN-System)
- Driver station
- Fire Extinguishing System

- NBC/AC-System
- Rear ramp



The inherent flexibility of BOXER provides an unique portfolio of advantages compared to all other vehicles

Procurement



- **Less Drive Modules** – Procurement of less Drive than Mission Modules possible
- **Specific Mission Modules** – Procurement of specific Mission Modules only possible
- **Efficient use** – Drive Modules are being used very efficient as they are capable to carry all Mission Modules

Adaptation and growth



- **National specific MM** – while relying on common Drive Module, national specific Mission Modules only to developed
- **Partner Nations** – minimizing development efforts by relying on already existing Mission Modules from allied nations with only add-on development as far as necessary
- **Adaptation of Mission Module** – for major changes in specific (e.g. communication) only Mission Module to be adapted
- **Adaptation of Drive Module independently** – for major changes only the Drive Module has to be redesigned

Operation in theatre



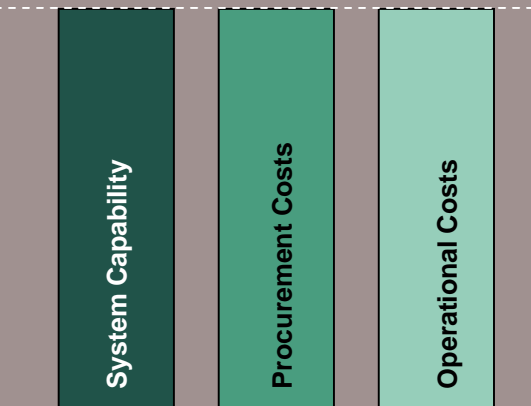
- **Tailored to Mission** – Vehicles tailored on daily basis to the mission
- **Severe puncture** – in case of severe puncture, Mission Module can be taken off and used further
- **Lowering costs of transport** – in case of overhaul in Denmark, only Drive or Mission Module are to be transported
- **Smaller technical reserve in theatre** – modular design allows for a lower number of complete vehicles on standby
- **Easing maintenance** – eased access to components (saving time)
- **Stationary situations** – some Mission Modules (e.g. AMB) could be used also in stationary situations

Less Drive Modules – procuring less Drive Modules than Mission Modules is feasible and provides unique advantages

Advantages of using less Drive than Mission Modules – generic

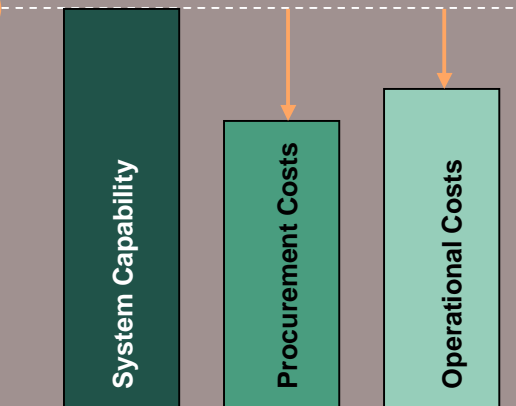
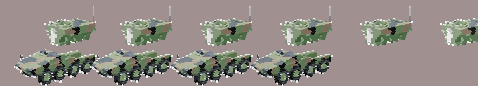
APC procurement “standard”

- Using standard vehicles
- No use of modular concept



APC procurement “optional”

- Use of modular concept
- Flexible use



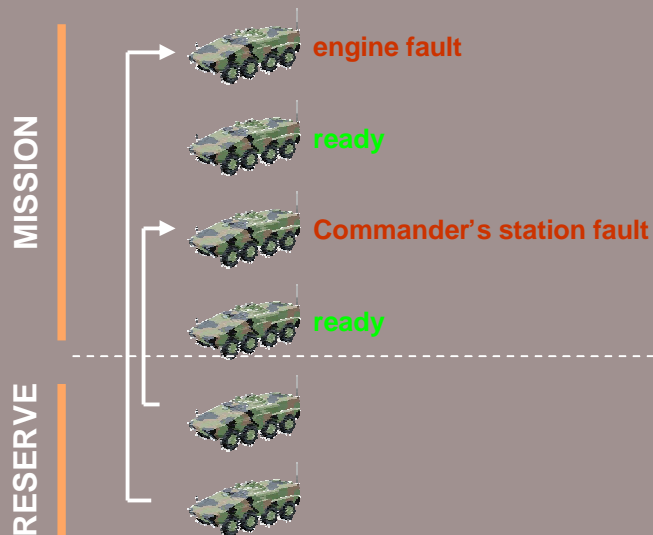
- Same system capability possible
- Reduced procurement costs
- Reduced operational costs

Smaller technical reserve in theatre – modular design allows for a lower number of complete vehicles on standby

Advantages of lower number of complete vehicles for reserve in theatre

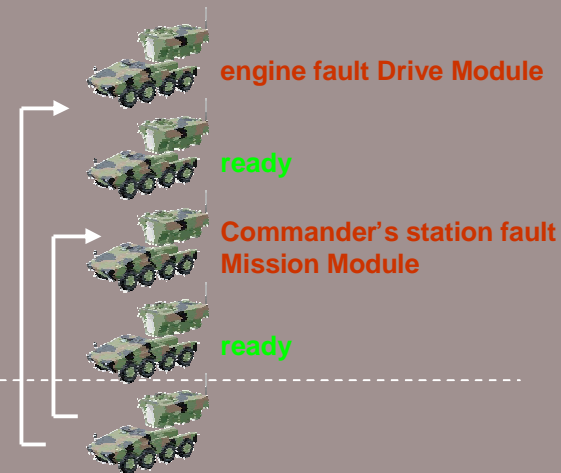
APC in mission “standard”

- Using standard vehicles or
- No use of modular concept



APC in mission “optional”

- Use of modular concept
- Flexible use



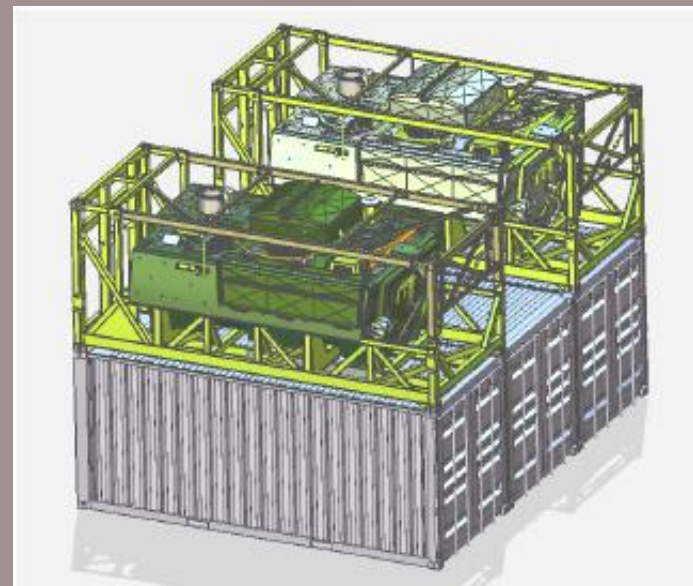
Lowering costs of transport – In case of overhaul in home country, only the Drive or Mission Module is be transported

Exemplary possibilities of transporting Mission Modules without a Drive Module

Transport on a Container-truck



Transport as a container





3. **BOXER** as an interesting solution also for the Danish Industry

Danish industry could benefit from advantages of BOXER and cooperation with leading German defence companies

Advantages of BOXER for industrial cooperation with Danish industry

- +** **Unique modular concept** provides a one-time opportunity for an industrial footprint with a wide range of participation of Danish industry
- +** **State-of-the-art technology** for land vehicles – esp. electrical system, welding, protection, drive train
- +** **Proven solution**
 - Manifold experience in production and development due to current German/Netherlands-Programme
 - Successfully operated by German Army in theatre
- +** **Access to business opportunities** of Krauss-Maffei Wegmann Rheinmetall and MAN



The modularity of BOXER provides for unique opportunities for industrial cooperation ...

Modular sub-systems of BOXER



Mission Module

- One common hull floor and currently only 2 different hulls
- Rear ramp
- NBC-unit
- Hatches
- Part of electrics

R&D and/or production completely by Danish Industry from begin onwards




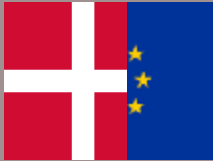
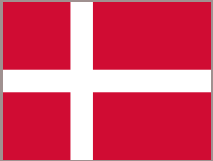
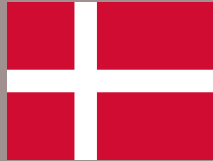
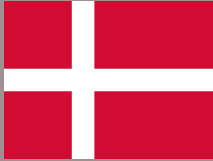
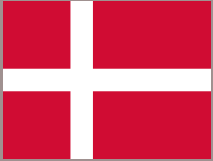
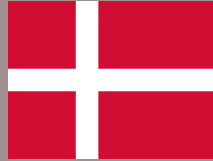
Drive Module

- Power Pack
- Running Gear
- Hull Drive Module
- Driver station
- Pneumatic/hydraulic power unit

Step-by-step approach in production – starting with components via sub-systems to complete assembly

... as the Drive and the Mission Module can be handled separately in terms of development, production and service

Possibilities of BOXER for an industrial concept

Step of value chain	Unique to BOXER		Logistics ¹⁾
	Drive Module	Mission Module	
Development			
Production incl. <ul style="list-style-type: none"> • Procurement • Assembly • Integration • Delivery 	 <p>Depending on capabilities and experience</p>		
Services			

1) Documentation/Manuals, Spares, Special Tool, Training equipment, Training

Besides BOXER, ARTEC's shareholders are an ideal partner for Danish industry, offering a complete defence portfolio

- Offering a **complete Land Systems Portfolio** ...
 - 4x4, 6x6, 8x8, tracked vehicles
 - Weapon stations
 - C4I-Systems, Air Defence
 - Soldier Systems ...
- ...via the **complete value chain** ...
 - R&D, Production, Service (incl. training, training equipment, spares supply, maintenance, in-theatre support, special tools, documentation)
- ...**since decades**
 - Rheinmetall: established 1889
 - KMW: established 1838



ARTEC and its shareholders are open to enter into any cooperation scenario with Danish Industry

- A **cooperation** with Danish industry could encompass:
 - Adaptation of specific Mission Modules
 - Series Production
 - Components, sub-systems
 - Drive and/or Mission Module
 - Assembly and Integration
 - Logistic Support, Maintenance – also Performance Based Logistics
- The BOXER Modular concept specifically allows for development and production of the Mission Modules by **Danish Industry** based on **Danish Army's requirements** similar to the Netherlands entrance into the Programme in 2004

