



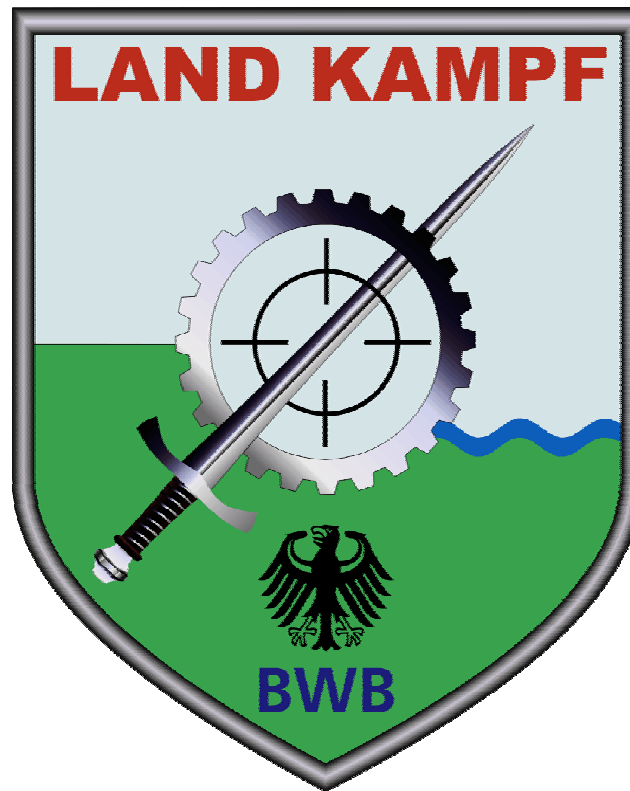
Bundesamt für Wehrtechnik und Beschaffung



Bundeswehr

BWB (German Federal Procurement Office)

Department „Land Kampf“ (Land Armament)



Project Group K41: Artillery, Mortars and Ammunition



Bundeswehr



K 41 - Mortar

**Lightweight 120mm Mortar
WIESEL 2, air transportable**





1. Main Design Drivers - 120 Mortar System:

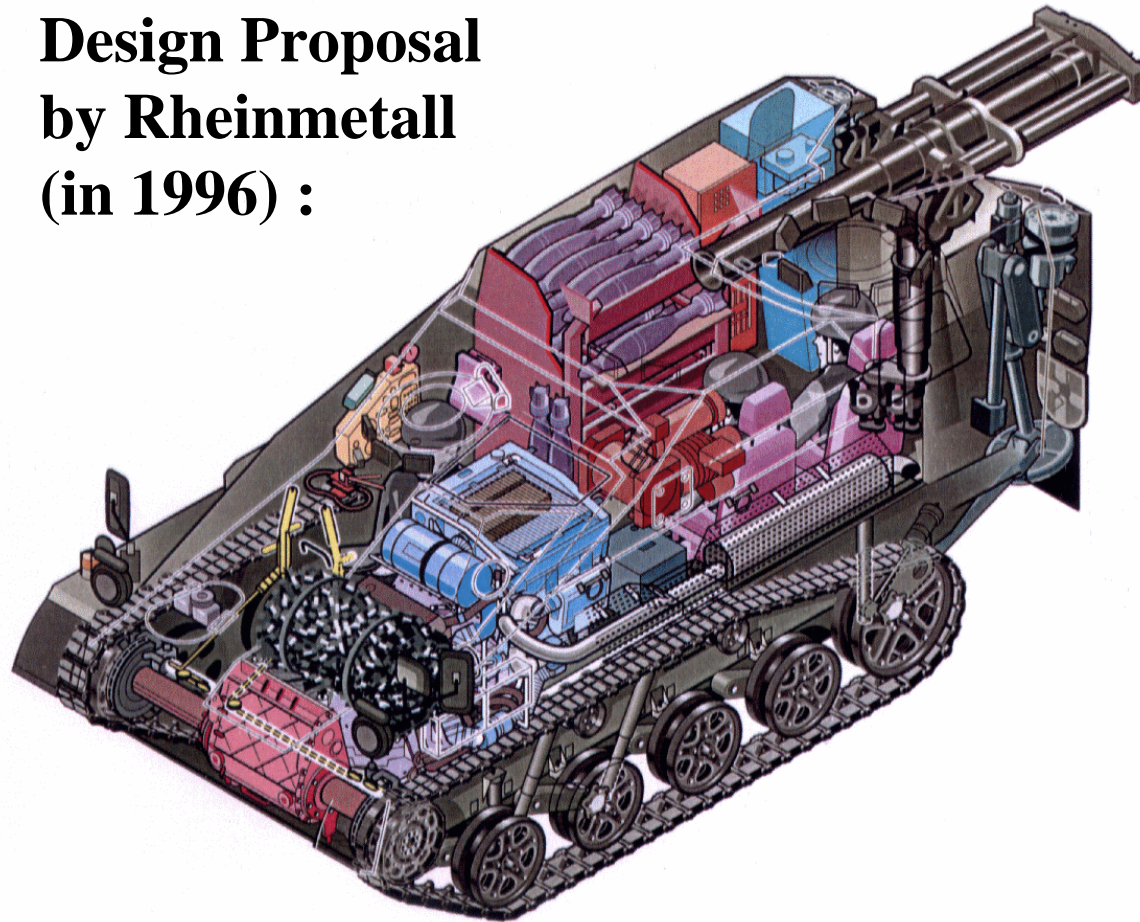


- **Air Transportable in CH 53 and 2 EA in C 160 Aircraft**
- **Operation and Deployment under Ballistic and NBC Protection**
- **Shoot & Scoot: < 90 secs reaction time to fire the first round**





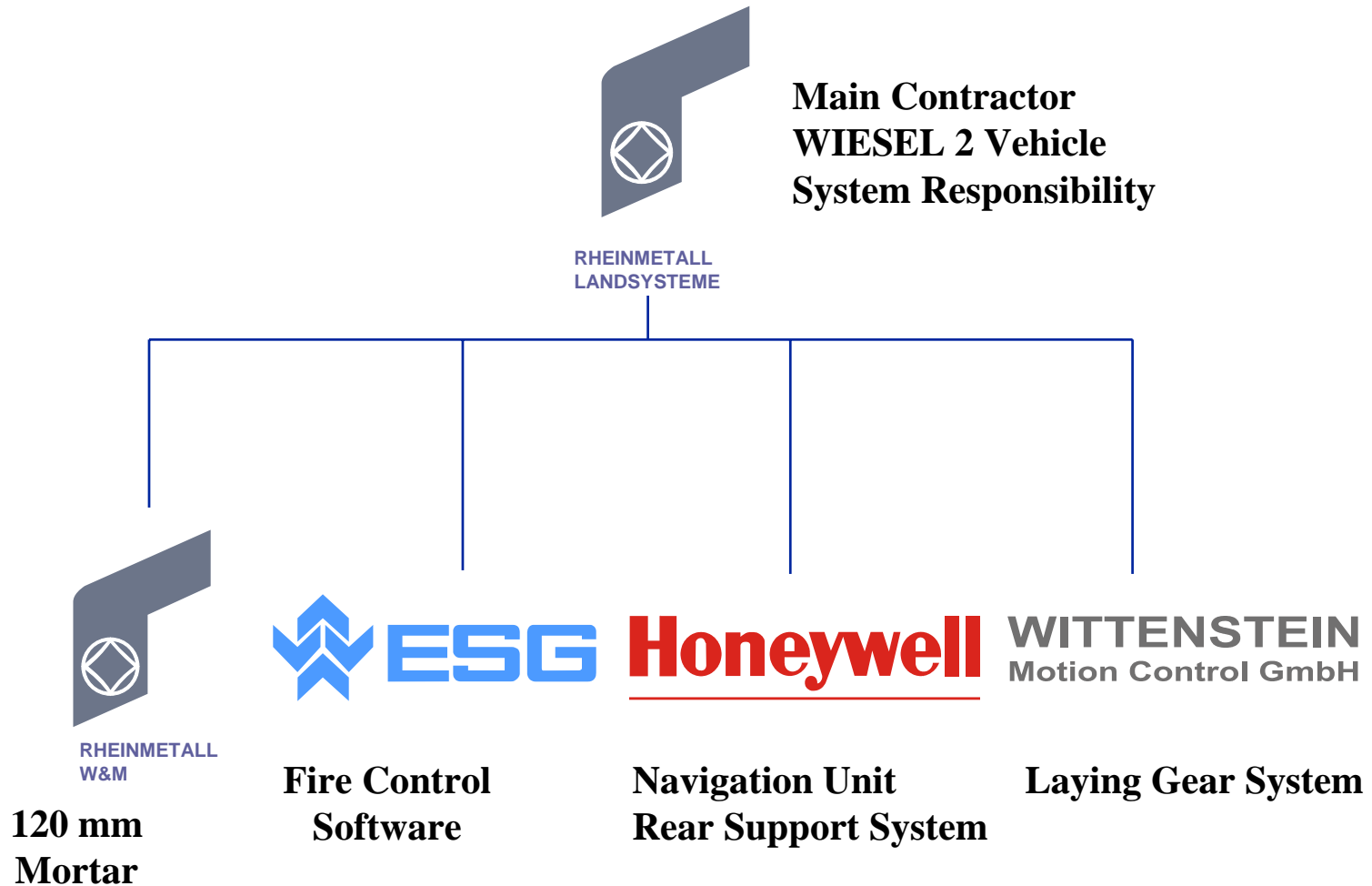
Design Proposal by Rheinmetall (in 1996) :



- **tracked WIESEL 2 vehicle**
- **CH 53 – limitations:**
 - weight 4.5 tons
 - length x width x height
4.52 m x 1.82 m x 1.81 m
- **Closed Combat Room**
- **Combat load 27 cartridges**
- **Hybride Navigation System**
- **Autonomous Ballistic Calculation**



Cooperation WIESEL Mortar





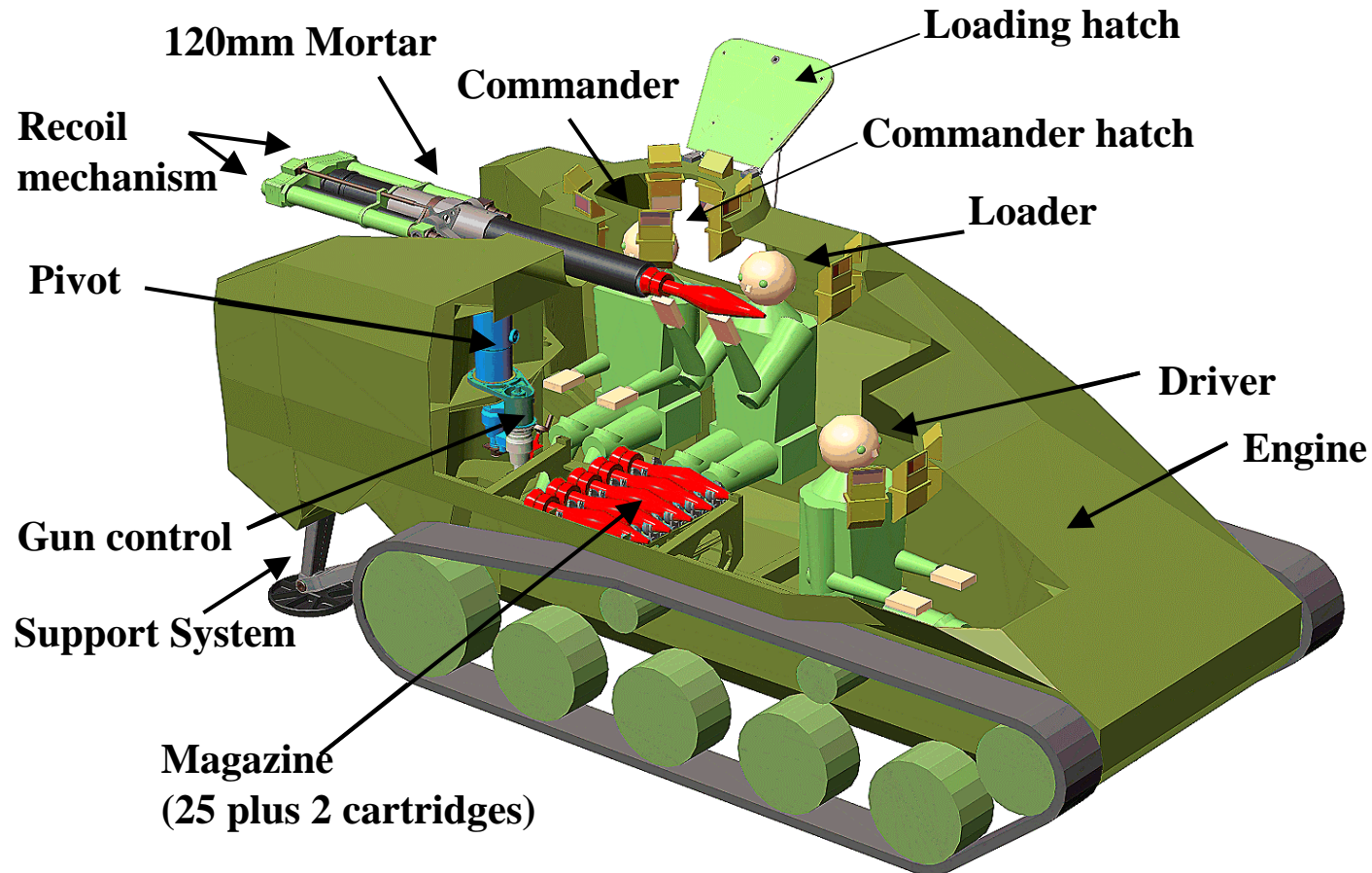
Vehicle - Main Technical Data

- **Combat mass** 4.500 kg
- **Crew** 3 men incl. driver
- **Magazine capacity** 25 + 2 cartridges special guided
ammunition (length < 1 m)
- **Air transportable inside the helicopter CH 53 G**
- **NBC - protection**
- **Cooling device for fighting compartment**
- **Hybride Navigation System** automatic position finding
automatic adjustment of laying position
- **Automatic ballistic calculation**
- **Shoot & Scoot:** needs < 90 secs reaction time to fire the first round
- **Fire rate:** burst rate 3 rounds < 20 secs
sustained rate 6 rounds/min over 3 minutes
- **Fuze setting automatically (option)**



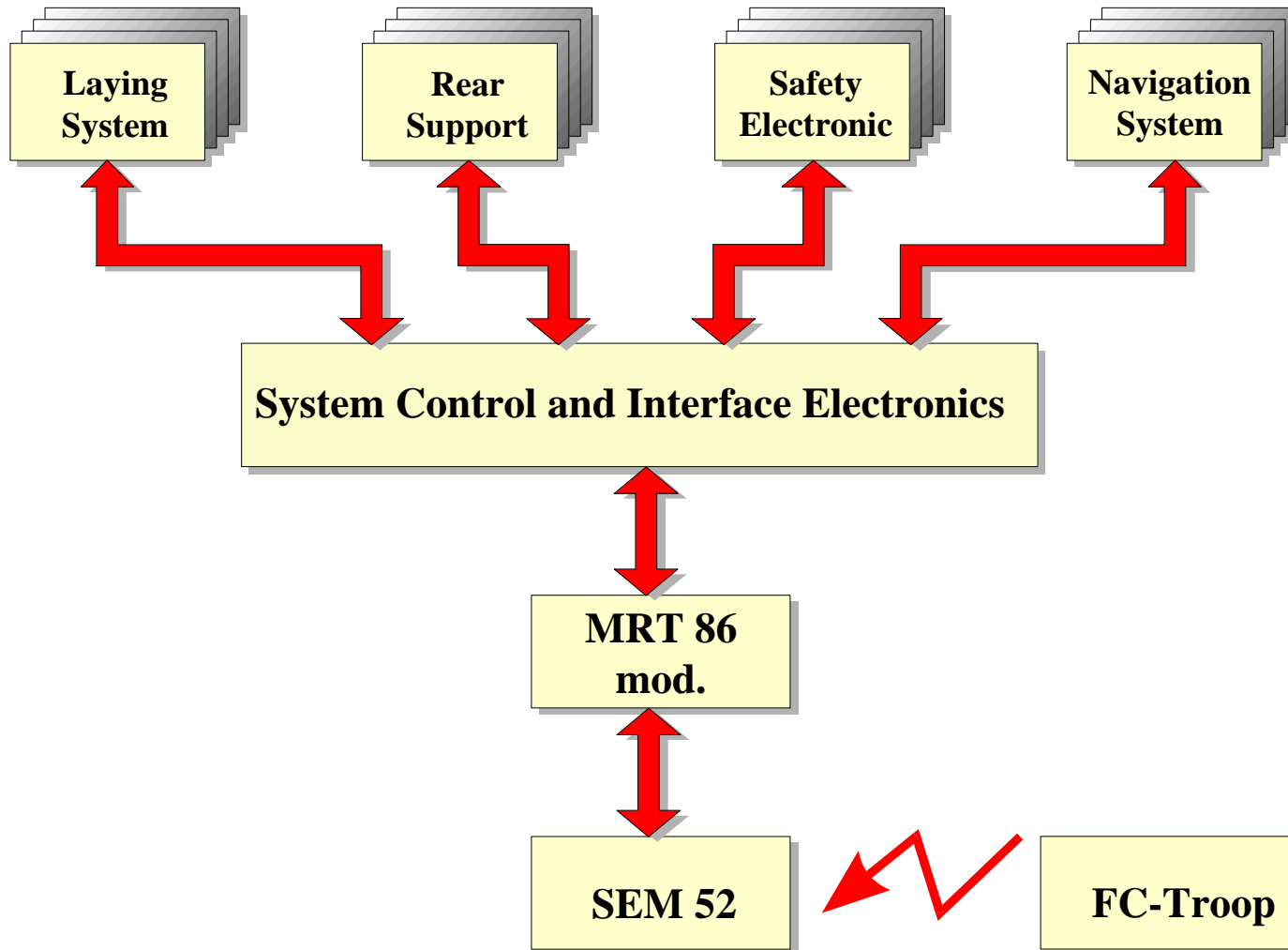


2. Weapon System Setup



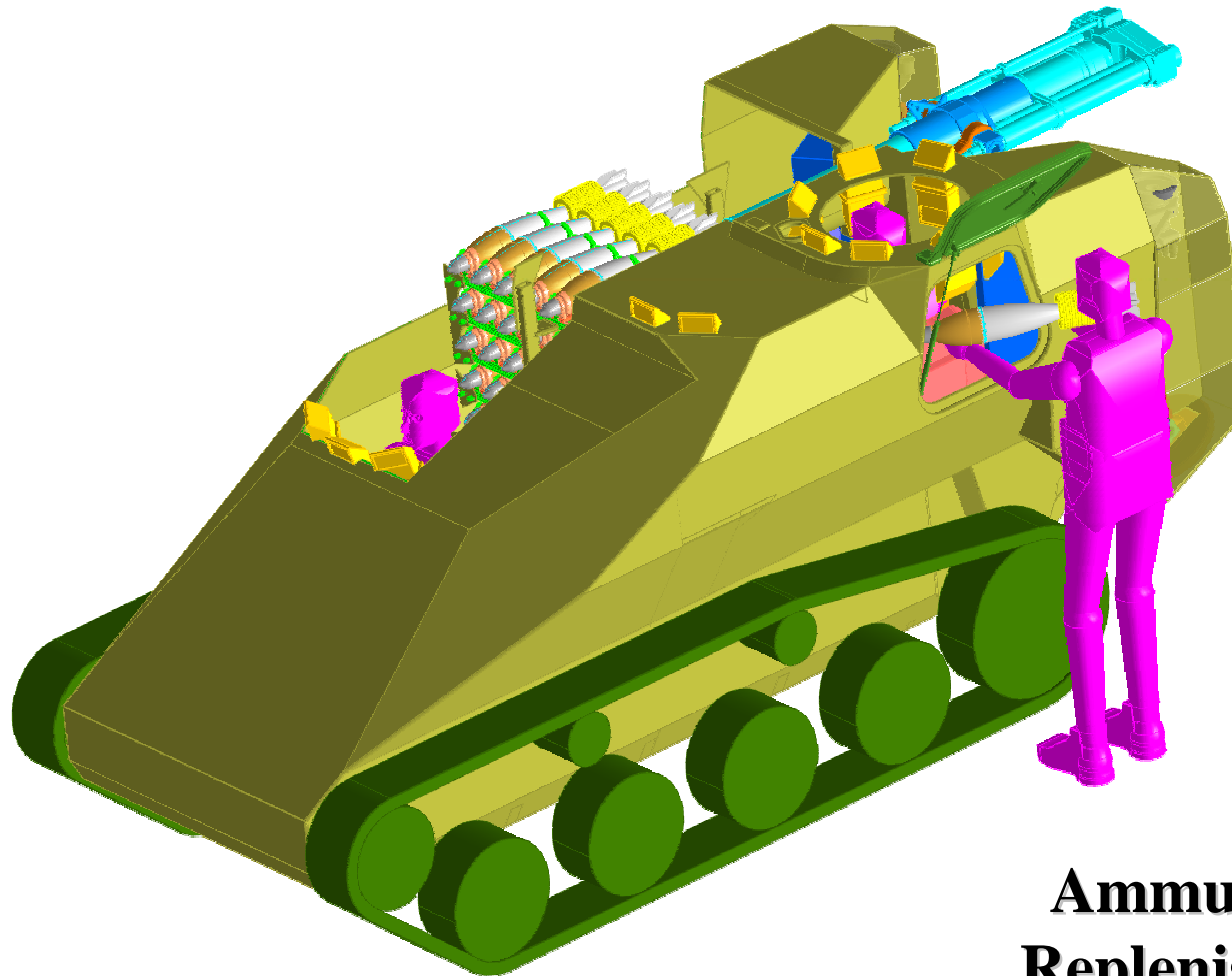


System Electronic and Data processing





3. Fire Procedure



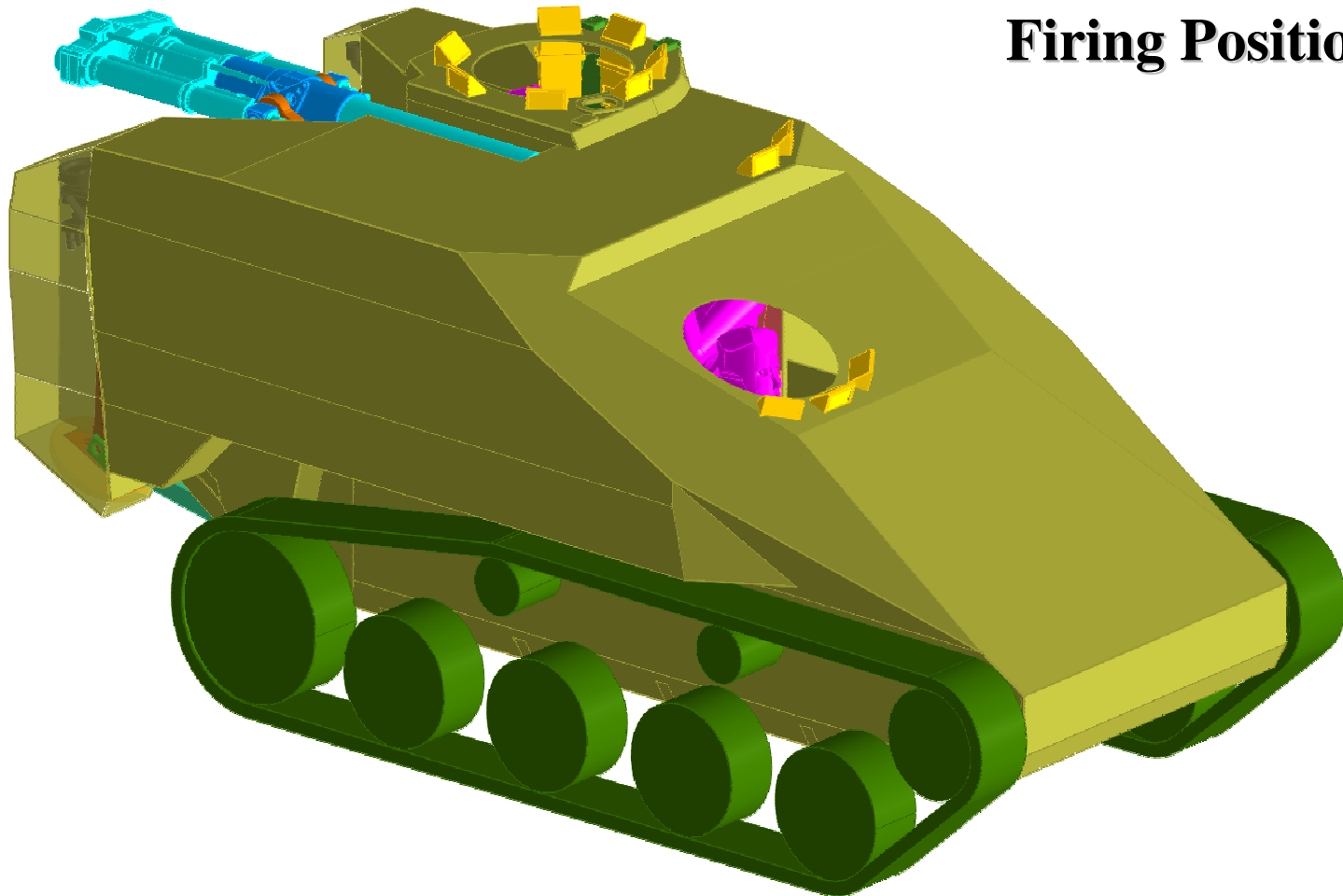
**Ammunition
Replenishment**





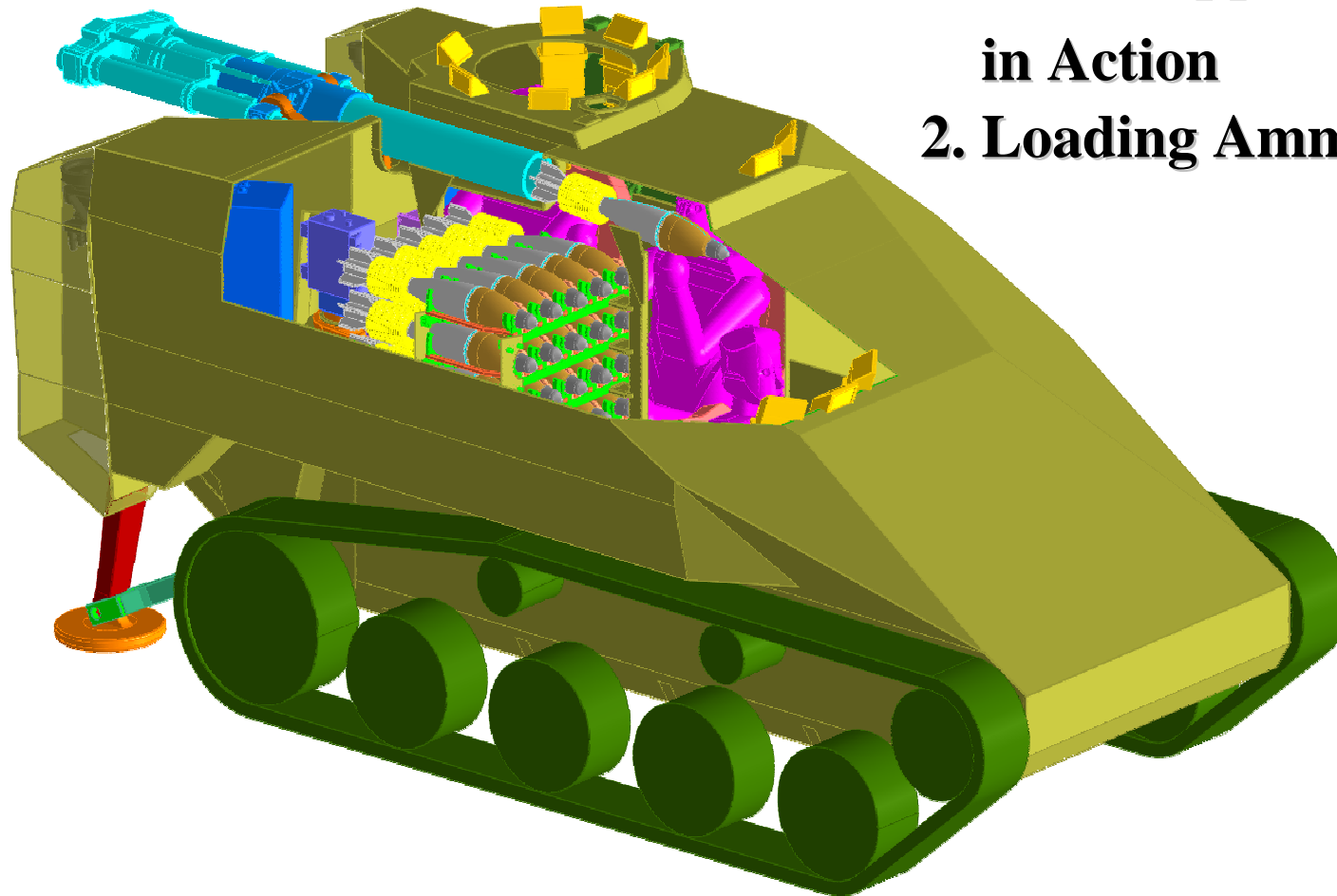
Fire Procedure

Driving into Firing Position





Fire Procedure



Gun ready Position:

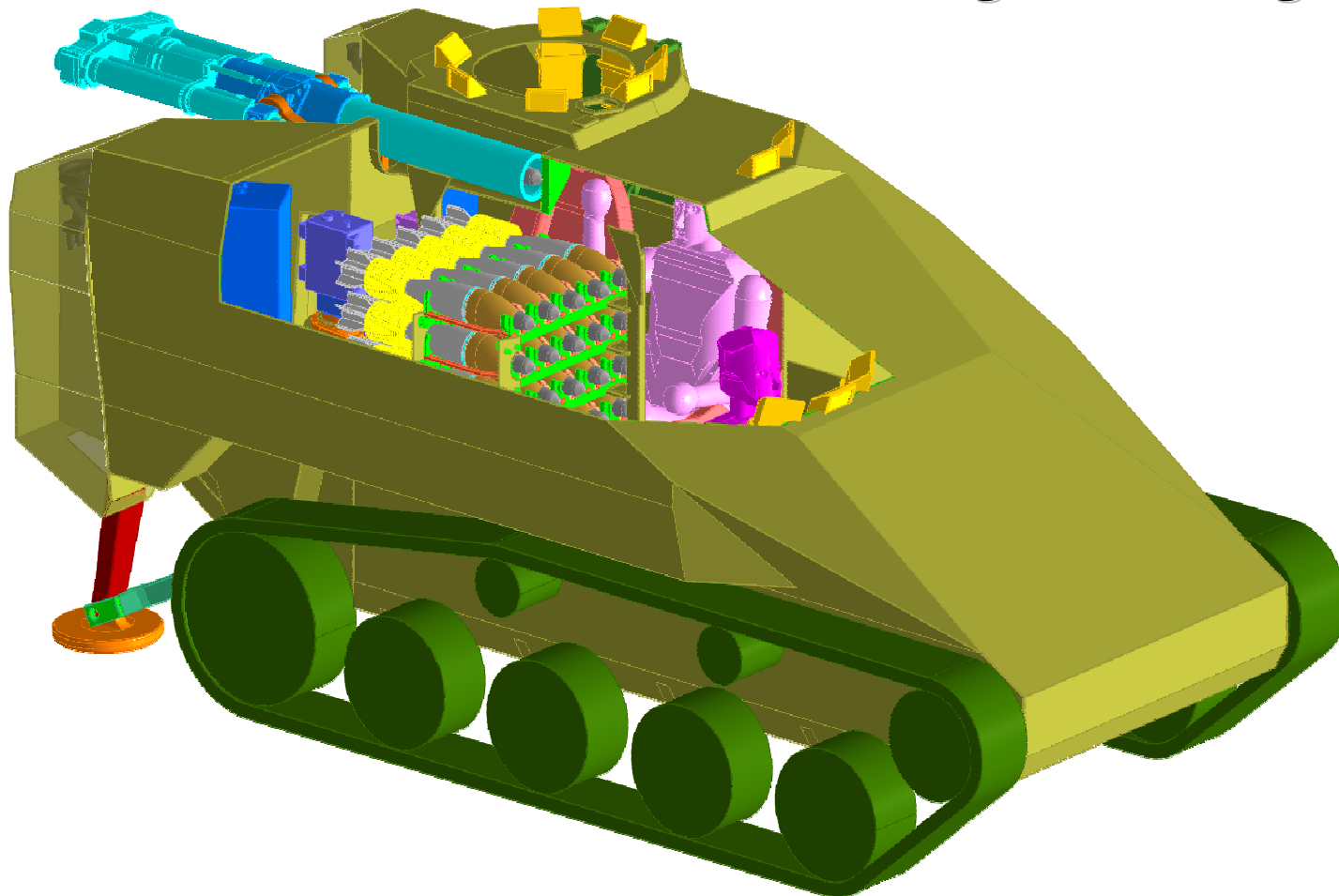
1. Rear Support System
in Action
2. Loading Ammunition





Fire Procedure

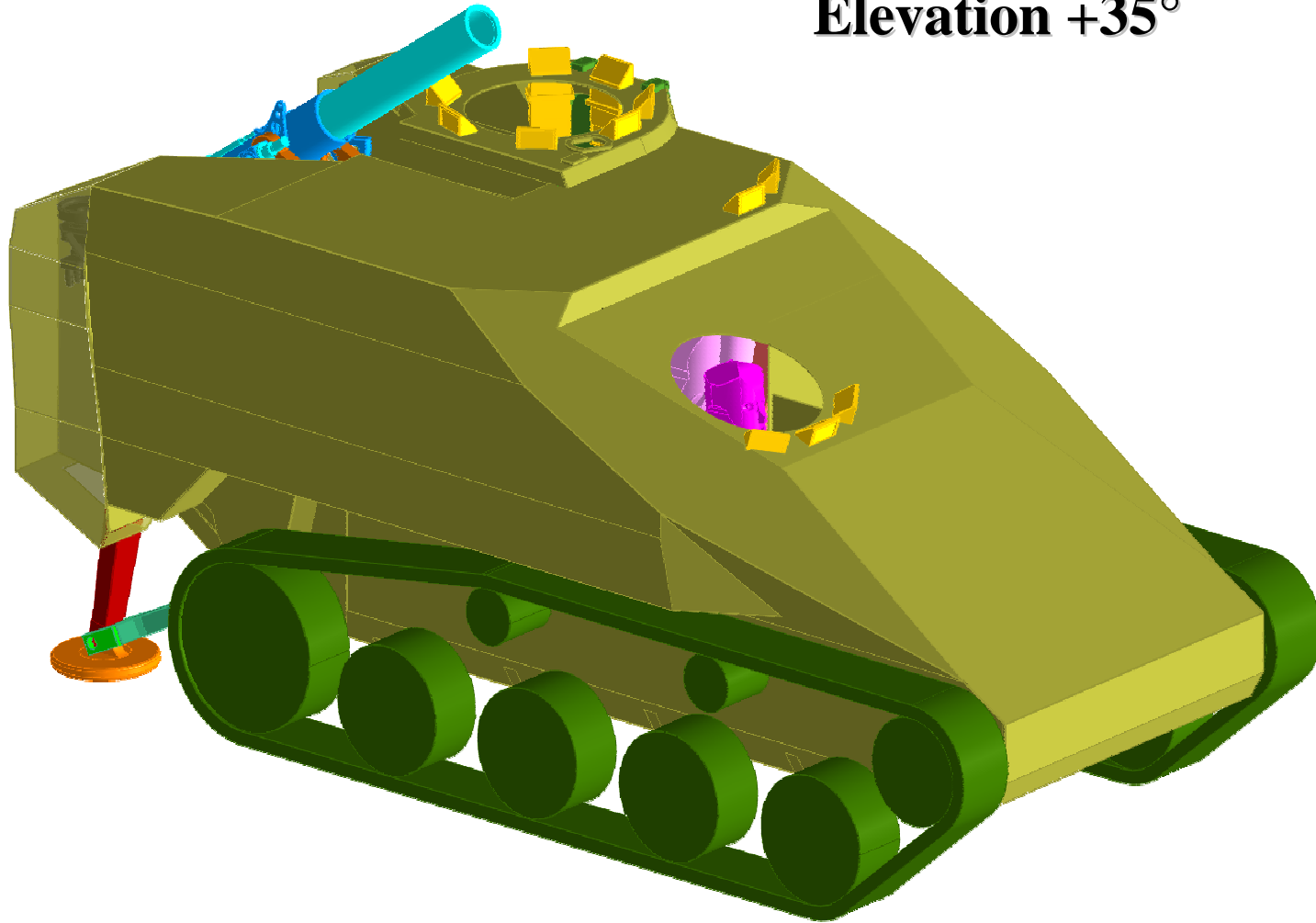
Gun ready Position: Closing the loading hatch





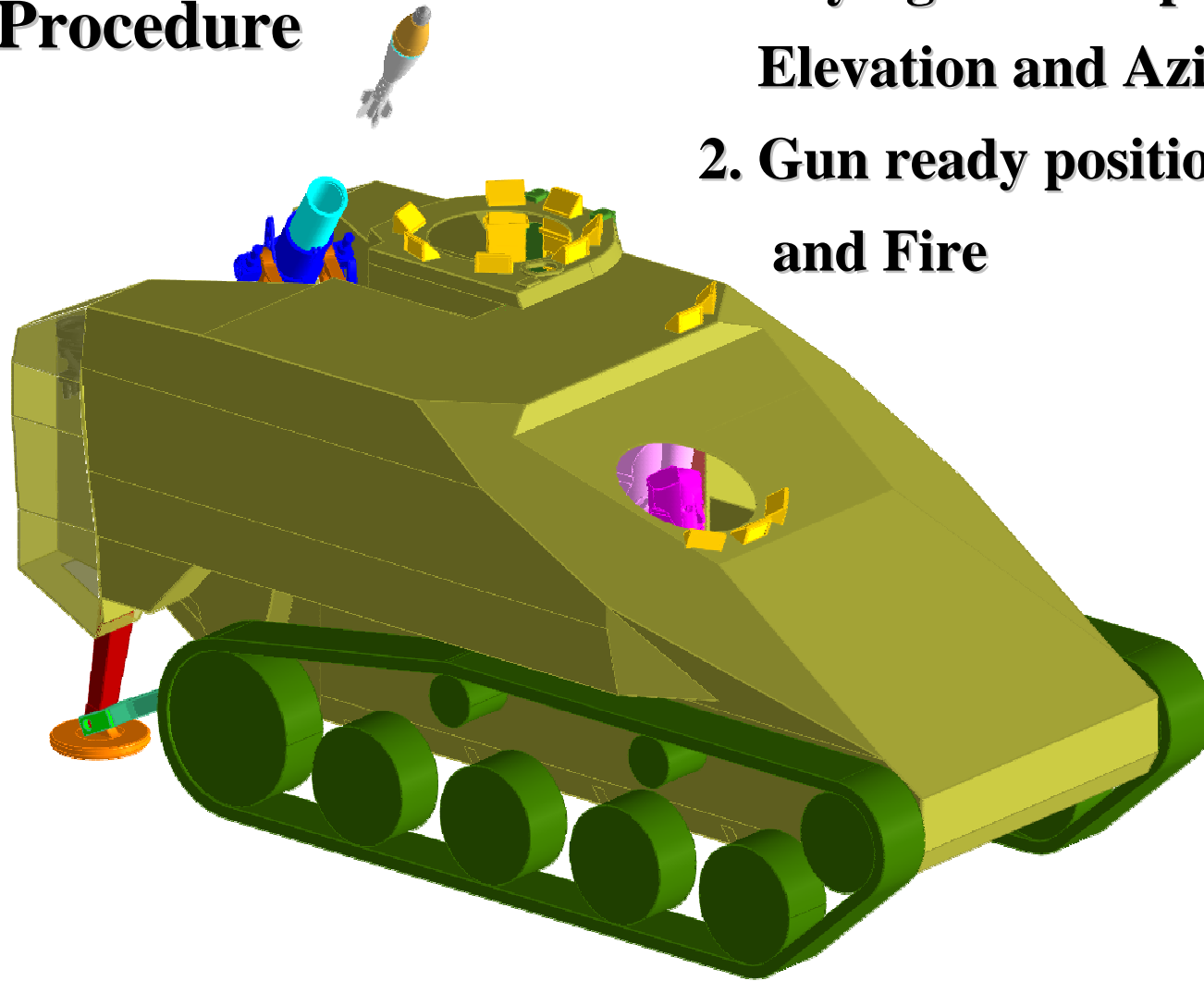
Fire Procedure

Preparation of laying the Weapon:
Elevation $+35^\circ$





Fire Procedure



1. Laying the Weapon
Elevation and Azimuth
2. Gun ready position
and Fire





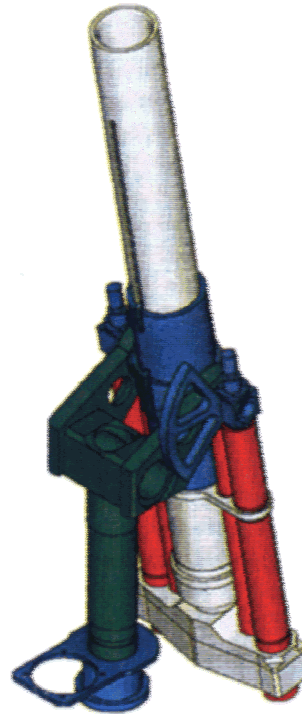
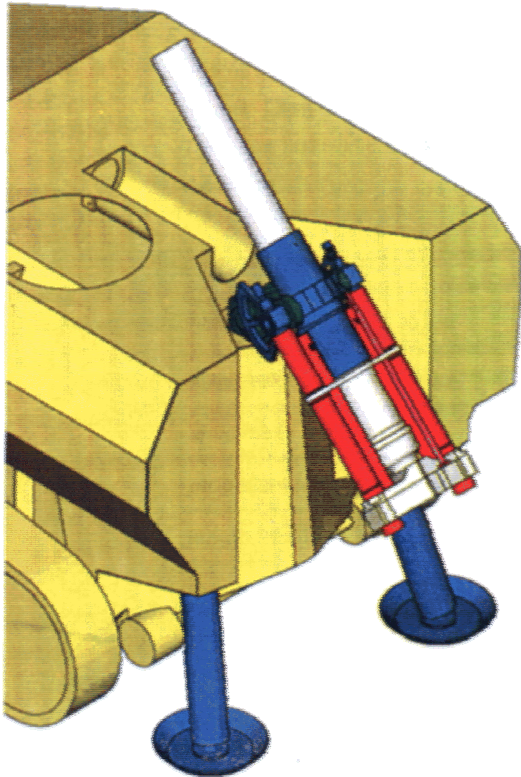
4. Weapon System - Technical Data

- **Firing range**
> 6.000 m with ammunition in service
> 8.000 m with new ammunition
- **Firing rates**
3 rounds in 20 s
6 rounds in 60 s for 3 min
- **Elevating limits**
0° to 85°
40° to 85° (firing limits)
- **Traversing limits**
± 30°
- **Tube length**
1.7 m
- **Fatigue life of barrel and breech**
(acc. to ITOP 3-2-829)
4.000 rounds at 135 MPa (FDP)
(Tampella 400 rounds)
- **Recoil travel**
500 mm max.
- **Recoil force**
260 kN max.
- **Mass incl. pivot**
295 kg





Weapon System



**Integration of the
Mortar-Weapon
at the Rear of
WIESEL 2 System
supported by a
Recoil Force
Reduction System**





DM 11



HE-L
6 km



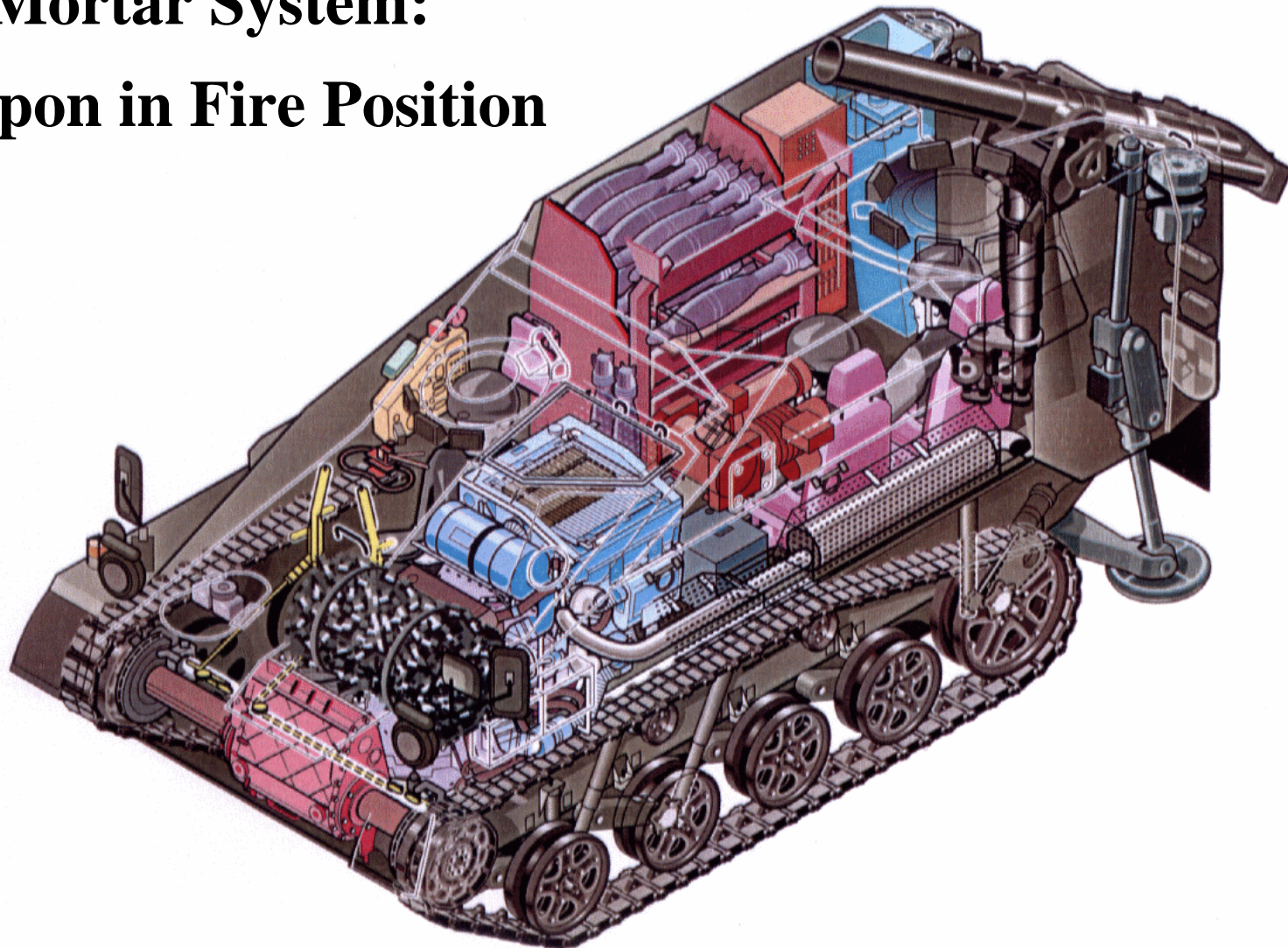
HE-L
8 km

Ammunition:

- 120 mm fin stabilized
- Range: 600m - 6300m
- Tampella HE-Ammunition**
(length 580mm & weight 12.6 kg)
- Weapon is designed for
Range: 600m - 8000m
- new HE-L-Ammunition**
(length 800mm & weight ~15kg)
- **Guided Ammunition** (eg.
PGMM, STRIX)

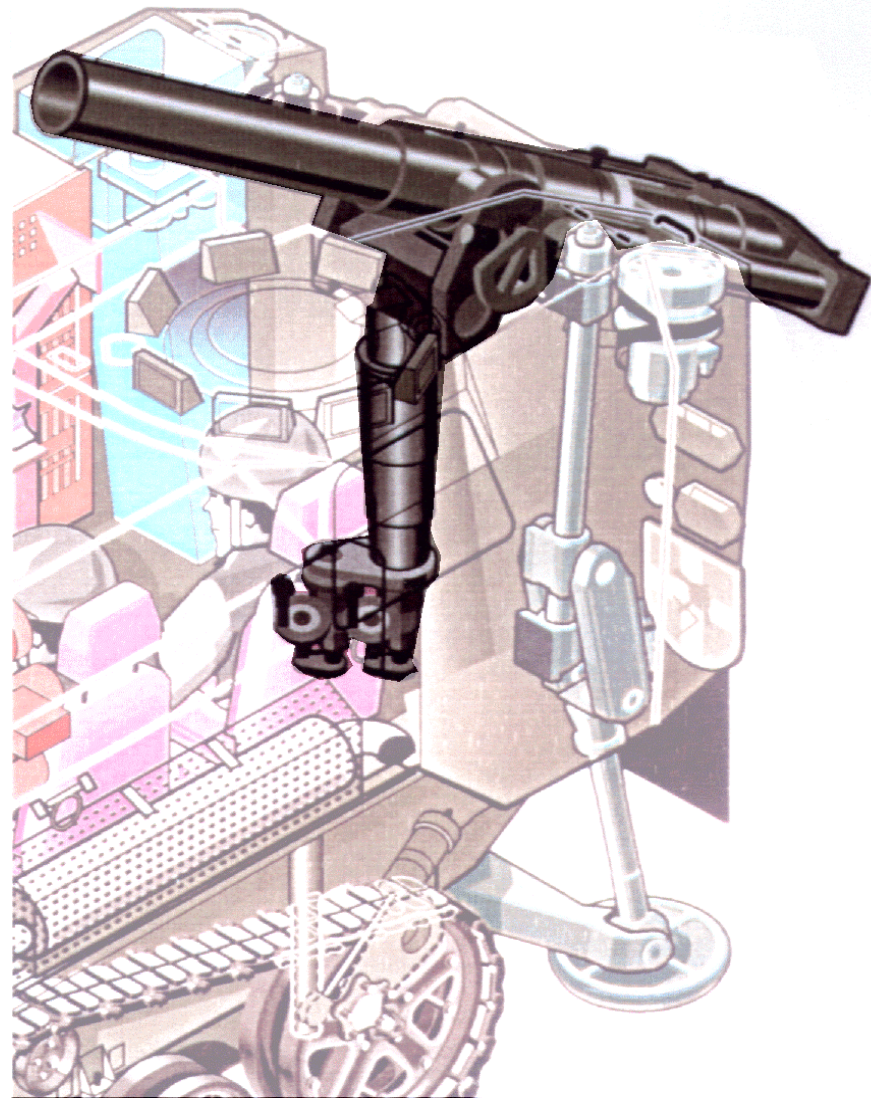


Mortar System: Weapon in Fire Position



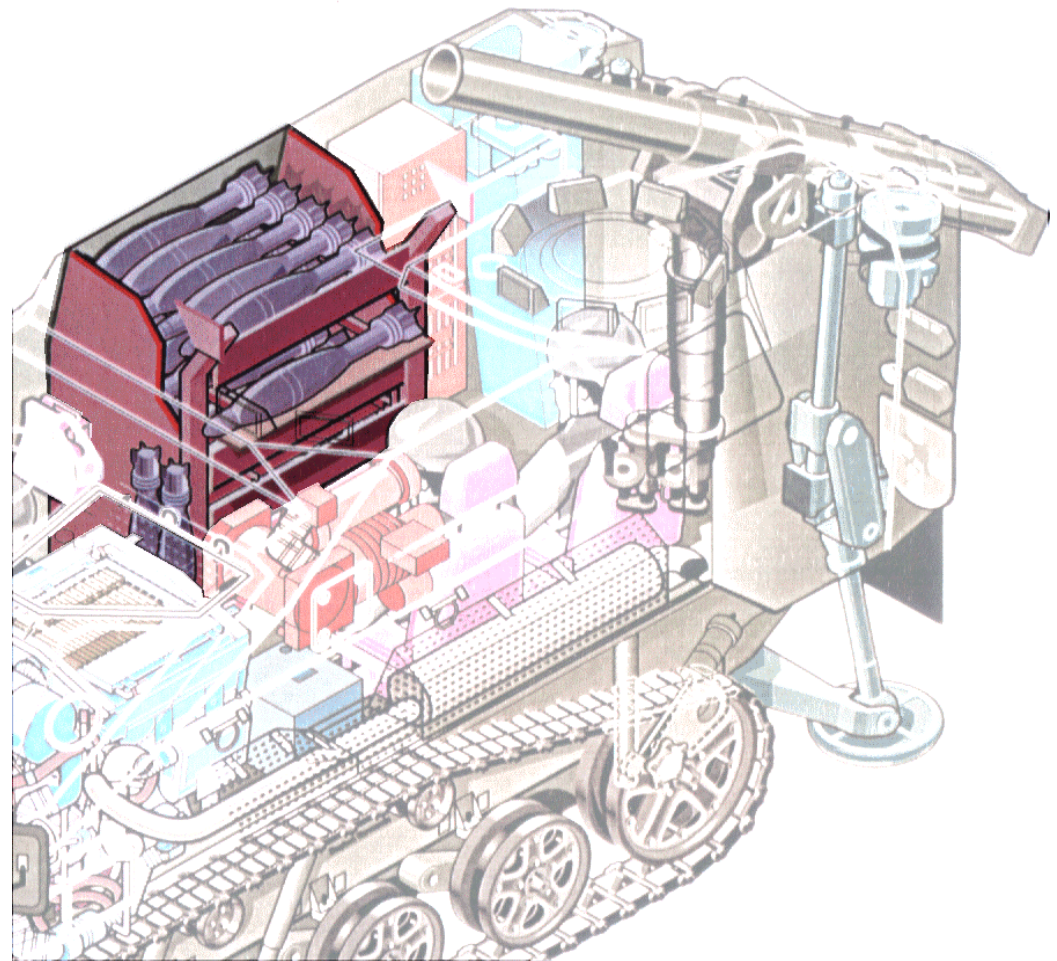


120mm Mortar: Weapon System with Pivot and Laying System



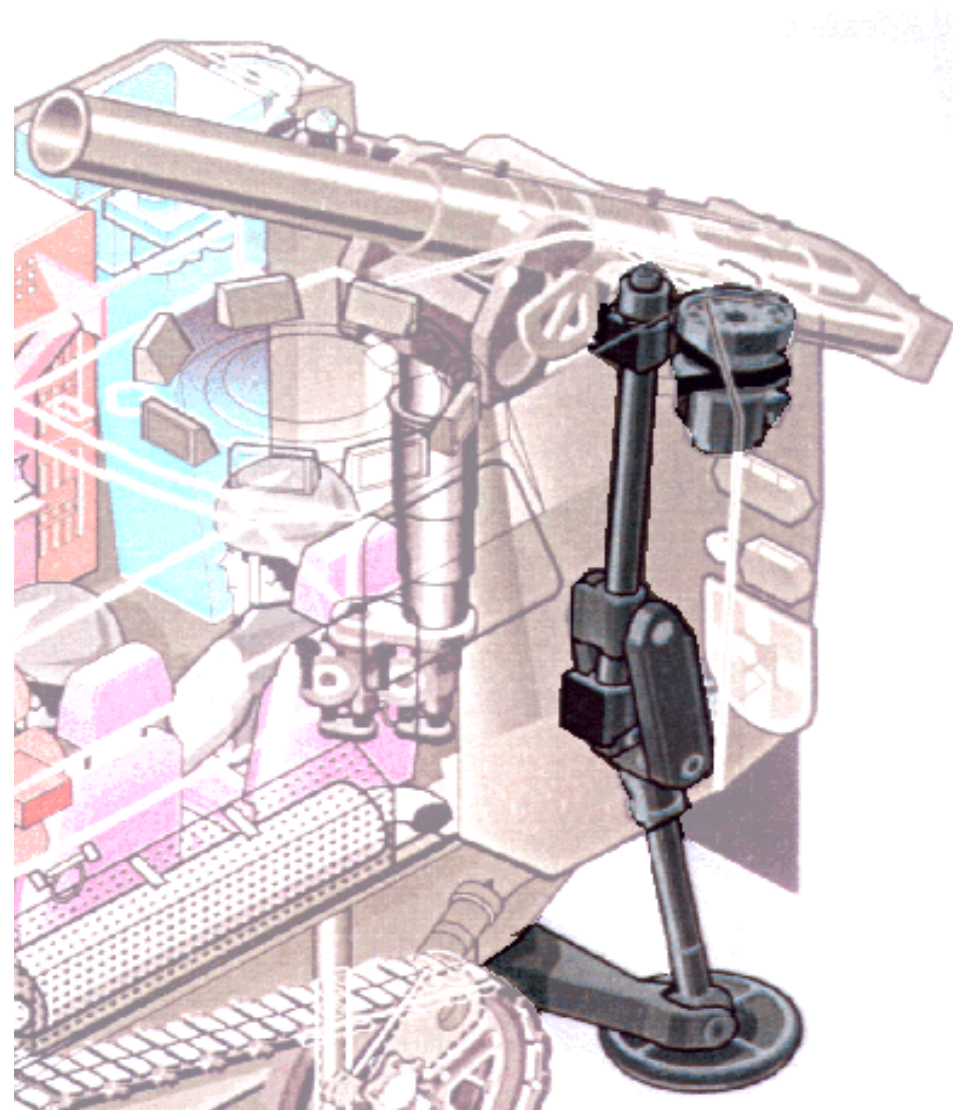


**120mm Mortar:
Ammunition-
magazine
for 25 plus
2 Cartridges
(6km or 8km
Ammunition)**





120mm Mortar: Rear Support System for Reduction of the Recoil- Impulse





Development and State of the WIESEL 2 Program:

- **1996** **Elaboration of Concept**
- **1997-1998** **Feasibility Studies**
 - **Production of a Demonstrator**
 - **Firing Trials for System Compatibility, Life Firing with Crew inside**
- **1998-1999** **Development of assemblies**
 - **Weapon System**
 - **Rear Support System**
 - **Laying System**
 - **Fire Control System**
- **1999-2004** **Complete System**
 - **Production and System Integration**
 - **Development & Development Trials**
- **2004** **Delivery of two test Vehicles**
- **2004-2007** **User Trials and Technical Trials**
- **2008** **Beginning of Series Production - German Infantry**





Demonstrator Testing: Air Transport with CH 53





Demonstrator Testing: Driving Trials

- **Max. Road Speed approx.** 70 km/h (44 mph)
- **Cruising Range approx.** 300 km (186 miles)





Demonstrator Testing: Firing Trials



Firing Data:

- Elevation 45° - 85°
- Azimuth $\pm 30^{\circ}$
- Recoil System
- Max. Range 8.3 km
(15 kg Cartridges)
- in Service Ammunition
nition (Tampella)
Range 6.3 km





Demonstrator: Ammunition Supply Vehicle

- Storage: ca. 50 Cartridges Ammunition HE-L 120 mm

