KONGSBERG

CROWS
Stabilization and Accuracy for today’s Warfighter
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Kongsberg Protech Systems

WORLD CLASS – through people, technology and dedication
- The history of KONGSBERG
- Background of the RWS
- Stabilization and Accuracy
- Key Performance Parameters
- The Future of RWS

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The History of Kongsberg

- The city of Kongsberg founded in 1624 by King Christian IV based on the discovery of silver in the area.
- The silver mine was the biggest industry in Norway and constituted about 20% of the income. In 1814 the Kongsberg weapons factory was founded.
- The Krag Jørgensen rifle was introduced in 1892, and became soon a big hit for the weapon factory. The US Army bought about 500,000 rifles, and it soon became one of the biggest export products for Norway.
- Kongsberg Weapons factory played a major role in post war recovery in Norway, after World War-2 renamed the Norwegian Defence Industry, and as we know it today, KONGSBERG.
First International Success

Krag-Jørgensen

The **Krag-Jørgensen** is a repeating bolt action rifle designed by the Norwegians Ole Herman Johannes Krag and Erik Jørgensen in the late 19th century. It was adopted as a standard arm by Denmark, the United States and Norway.

The Krag-Jorgensen Rifle in Rimmed .30 Army round found use in the Boxer Rebellion, the Spanish-American War and the Philippine-American War. In this later war the rifle was referred to in a song popular with U.S. troops with a verse running:

Damn, damn, damn the Filipinos!
Cut throat murdering ladrone!
Underneath the starry flag,
Civilize them with a Krag,
And return us to our beloved home.
Why a Remote Weapon Station
The Main Focus of Protech Systems:
- PROTECTOR Family of Remote Weapon Station (RWS)
- Common Remotely Operated Weapons System (CROWS)
- PROTECTOR Medium Caliber Remote Weapon Station (MC RWS)
- M151 PROTECTOR
- XM153 PROTECTOR CROWS
- PROTECTOR Lite
- PROTECTOR Super Lite
Vehicle Integrations
RWS Family

- Prototype 1997
- Kosovo 1998
- M151 2000
- M151 Javelin 2001
- M151 A1 2003
- M151 A2 2004
- NM221 2005
- LITE 2006
- SP 2007
- CROWS II 2008
- MC RWS 2009
What is the Remote Weapon System (RWS)?

- The RWS is designed to be mounted on top on a variety of combat vehicles and is remotely operated by an operator located inside the vehicle compartment, giving complete armored protection from direct enemy fire.

- The remote operation of the RWS is carried out by two operating components, 
  - Fire Control Unit (FCU)
  - Control Grip (CG).

- The system also has remote weapon charging capability for cocking of the weapon as well as firing.

- The tracking and control capabilities of the RWS provide a high first-round hit probability against stationary and moving targets.

- The RWS can also be operated manually if required.

- Integrated Machine Guns:
  - MK-19 40mm
  - M-2 .50 Cal
  - M-240 7.62mm
  - M-249 5.56mm
Main Parts

- RWS consists of following main parts:
  - Weapon Station (WS)
  - Fire Control Unit (FCU)
  - Control Grip (CG)
  - Connection Cables
    - (W1) Power and signal cable from FCU to CG
    - (W2) Data signal cable from FCU to WS
    - (W3) Power and video cable from FCU to WS
Line Replacement Units (LRU)

- Sight Servo Assembly (SSA)
- Cocking Actuator (CA)
- Soft Mount (SM)
- Amm Box
- Left Side Support Assembly (LSSA)
- Laser Range Finder (LRF)
- Thermal Imaging Module (TIM)
- Visible Imaging Module (VIM)
- Main Frame Assembly (MFA)
- Weapon Station (WS)
- Right Side Support Assembly (RSSA)
- Fire Control unit (FCU)
- Control Grip (CG)
Principal Factors in Stabilization and Accuracy

- Machine gun barrel condition – temperature and wear
- Soft recoil mount – attenuates recoil
- 4 axis servo system
- Stabilization on the move
- Lead angle compensation – determines lead on the move
- Fire Control unit – ballistic solution software
- Hand Control – man machine interface
**Bore Sighting**

- Bore sighting is the procedure of defining the position of the sight where the axis of bore and the line of sight are perfectly aligned.
- This position is stored by the system in the non-volatile memory of the FCU. At later start-ups, the system reads this position from that memory.
- Default values are used at power-up when no position is stored in the memory.
- This position is used as the basis for positioning the weapon according to the calculated ballistics for the defined target range and current ammunition.

**NOTE!**
Whenever a new weapon is mounted or a new FCU is connected, the bore and the line of sight must be aligned by performing the bore sighting procedure.

**NOTE!**
If one of the sensors is bore sighted, it is not necessary to do the same with the other sensors.
XM153 CROWS II – The Next Evolution
QUESTIONS ?

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