30mm Linear Linkless Ammunition Handling Technology in a Remote Weapon Station

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Dual feed AHS consists of two 76-Rnd magazines and two transfer units to move rounds from the magazines to the 30mm Mk44 dual feed weapon. The magazines mount to the turret rotor and rotate with the gun in elevation.
MCRWS AHS Overview

Load Tray (primary load port)

Left Transfer Unit

Right Transfer Unit

Manual Drive

Left Magazine

Magazine Lift Eye

Gear train driven by gun

Secondary (Under-Armor) Load Port

Right Magazine

Block dimensions (per side): L x W x H – 1021mm x 442mm x 378mm
Mount Configuration - Elevation

Round transfer path is simplified because of direct feet to the Gun Feeder at all elevations.
Using the gun feed-select solenoid, select the feed corresponding to the side being loaded.

Up to five rounds may be stacked on the tray.

Rounds will naturally feed into the organizer rotor. Replenish tray until rounds reach the hard stop in the gun feeder.
Under-Armor Reload – Optional Feature

Under-armor reload ports located in both left and right transfer units. Some gun elevation is desired for optimal reload position.
Under-Armor Load Procedure

Push a round into the transfer unit, defeating the door-spring, the round will slip in to the feed path rotor. The reload-door lip will stop forward motion when in correct position. The door will close, holding the round precisely positioned in the feed path.

Advance the magazine one position for insertion of the next round.

Note: door safety latch is not shown above, however it’s operation is transparent to the user.
Ammunition Flow Path Within AHS

Rounds being loaded into magazine

Empty chain returning to load port

Rounds exit transfer unit

Round is transferred from chain ladder to transfer unit
Chain Ladder Details

Crossbar (81X)
- Material: stainless steel
- Symmetric about mid-plane (Bidirectional)
- Crossbar taper matches case taper (30mm & 40mm)
- Weight: 52 grams
Round Guidance Detail

Panels provide case guidance at forward end of case

Side plate undercut retains round axially and normal to path

Crossbars guide round along bullet path
Transfer Unit Range of Motion

Articulating transfer unit accommodates tolerance stack-up between magazine and gun feeder. Allows relative motion between magazine and feeder expected during gun fire.

Angular range of motion of successive segments (Fixed stops limit range of motion)

Pivot fixed on magazine

Pivot fixed on gun feeder

Resulting transfer unit range of motion bounded by red outline
30mm Linkless AHS Summary

- System elevates with the gun / round path does not change eliminating the need for traditional flexible chutes
- System is solely mechanical / no electronics
- Power required to cycle is minimal and is smooth / no power required to strip links
- No scheduled maintenance / chain is pre-lubricated / bearings are sealed / FOD has tendency to fall through
- Over 1000 rounds fired to date
- System operation video… *Kongsberg30mmAHS_Short.wmv*