Agenda

• History of the two NATO rifle calibers.
• NATO Nominated Weapons.
• STANAG 4694 “NATO Accessory Rail”.
• National programs.
• Small arms lethality.
History of 7.62 NATO

- In WWII the Allies learned that ammunition supply was a nightmare.
- After NATO was founded in 1949, it was therefore decided to standardize calibers.
- USA proposed that the new rifle caliber should be the US developed .30 Light Rifle (7.62x51mm), which was a shortened .30-'06.
- GBR proposed the British 7.1x43mm intermediate caliber.
- In 1953 NATO standardized 7.62x51mm as the new rifle caliber.
History of 5.56 NATO

• In 1970 NATO decided to try to standardize a common rifle and a second rifle caliber.
• During 1977-1980 they therefore performed mutual tests with rifles and ammunition.
• The calibers tested were:
  – 5.56mm rounds with increased penetration from BEL and USA.
  – GBR 4.85mm round.
  – DEU 4.7mm caseless round.
# NATO rifle and ammunition trials 1977-1980

<table>
<thead>
<tr>
<th>Country</th>
<th>Weapon</th>
<th>Caliber (mm)</th>
<th>Ammunition</th>
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<tbody>
<tr>
<td>Germany</td>
<td>G11</td>
<td>4.7</td>
<td>4.7 caseless</td>
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<tr>
<td>United Kingdom</td>
<td>4.85 IW</td>
<td>4.85</td>
<td>4.85</td>
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<tr>
<td>Belgium</td>
<td>FNC</td>
<td>5.56</td>
<td>SS109</td>
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<tr>
<td>Netherlands</td>
<td>MN 1 (Stoner 63)</td>
<td>5.56</td>
<td>M193</td>
</tr>
<tr>
<td>United States</td>
<td>M16A1</td>
<td>5.56</td>
<td>XM777</td>
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<tr>
<td>France</td>
<td>FAMAS</td>
<td>5.56</td>
<td>F1 brass and steel cased (M193 type)</td>
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<td>United States (control)</td>
<td>M16A1</td>
<td>5.56</td>
<td>M193</td>
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<tr>
<td>Germany (control)</td>
<td>G3</td>
<td>7.62</td>
<td>7.62 NATO</td>
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</table>
The results

- No weapon could be agreed upon.
- Some were in their prototype status.
- The BEL SS109 round was found to be the best, and was standardized as NATO’s second rifle caliber in 1980.
There is no NATO rifle!

• During the tests the US M16A1 was a control weapon.

• You can often see reference to:
  – NATO/STANAG magazine.
  – NATO/STANAG flash hider.
  – NATO/STANAG bayonet.

• There is currently no such thing!
NATO Nominated Weapons

• NNW’s are used as reference when new ammunition is standardized.

• As of 2009 the 5.56mm rifles are:
  – FNC, Belgium
  – G36, Germany
  – AR70/90, Italy
  – L85A2, United Kingdom
  – M16A2, USA

• A new NNW must work with all qualified 5.56mm ammunition designs.
### 5.56mm NATO Ball Qualified Designs

<table>
<thead>
<tr>
<th>NATO Design Number</th>
<th>Sponsoring Country</th>
<th>Head Stamp Initials</th>
<th>Publication Date</th>
<th>Manufacturer</th>
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<tr>
<td>AC/225-111A</td>
<td>USA</td>
<td>LC</td>
<td>30/06/1987</td>
<td>GOCO, Lake City, USA</td>
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<td>WCC</td>
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<td>Olin Winchester USA</td>
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<td>TAA</td>
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<td>205th Arsenal, Taiwan</td>
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<td>AC/116-112A</td>
<td>BEL</td>
<td>FNB</td>
<td>14/11/1989</td>
<td>Fabrique Nationale, Belgium</td>
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<td>AC/225-113A</td>
<td>ITA</td>
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<td>12/04/1990</td>
<td>Europa Metalli, Italy</td>
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<td>AC/225-114A</td>
<td>GBR</td>
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<td>AC/225-116A</td>
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<td>AC/225-117A</td>
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<td>HP</td>
<td>15/05/1996</td>
<td>Hirtenberger, Austria</td>
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<td>AC/225-118A</td>
<td>CAN</td>
<td>IM</td>
<td>17/01/1997</td>
<td>GD-OTS, Canada</td>
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<td>AC/225-120A</td>
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<td>FNM</td>
<td>31/08/1998</td>
<td>Indep, Portugal</td>
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<td>AC/225-122A</td>
<td>ITA</td>
<td>GFL</td>
<td>11/01/1999</td>
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<td>AC/225-124A</td>
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<td>AC/225-125A</td>
<td>DEU</td>
<td>DAG</td>
<td>10/03/2000</td>
<td>RUAG, Germany</td>
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<td>MEN</td>
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<td>MEN, Germany</td>
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<tr>
<td>AC/225-126A</td>
<td>BEL, FRA</td>
<td>IMI</td>
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<td>AC/225-127A</td>
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<td>SB</td>
<td>26/09/2000</td>
<td>Santa Barbara, Spain</td>
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<td>AC/225-128A</td>
<td>NOR</td>
<td>CG</td>
<td>6/07/2004</td>
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<td>AC/225-130A</td>
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<td>GGG</td>
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<td>AC/225-132A</td>
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<td>RG</td>
<td>30/01/2006</td>
<td>BAE Systems Radway Green, United Kingdom</td>
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</table>
W&S STANAG’s

- We are currently updating STANAG’s that were created during the cold war to better reflect current and future operation:
  - STANAG 4512 Dismounted Personnel Targets
  - STANAG 4513 Incapacitation & Suppression
  - STANAG 4498 Unarmoured Vehicles, Helicopters & Field Fortification Targets
  - STANAG 4536 Representative Building Targets
- STANAG 2129 - Identification of land forces on the battlefield and in an area of operation.
- STANAG 4694 NATO Accessory Rail.
Ten Nations have under the umbrella of the NATO Research and Technology Organization (RTO) formed a team with the objective to standardize a NATO rail.

Industry has been heavily involved.
STANAG 4694 “NATO Accessory Rail”

• Approved by NATO on May 8.

• The NATO Accessory Rail has full backwards compatibility with MIL-STD-1913 rail grabbers/mounts.

• Recommendation on how to attach rail grabbers/mounts to the NATO Accessory Rail.
MIL-STD-1913 / STANAG 4694

The differences between MIL-STD-1913 and STANAG 4694 are:

- Metric drawing.
- Added some new necessary measurements and tolerances.
- Adjustment of some measurements.
- Reduction of straightness tolerances with approx 50%.
Recommendations

• On a typical Mil-Std-1913 rail the grabber is clamping the rail on the v-angles.
• Our tests have shown that this does not provide good repeatability.
• We recommend instead that the top surface is used as a reference and alignment of the grabbers.
• Our tests have shown that this provides excellent repeatability.
National programs

• Information exchange is an important issue.
• This has shown that there are many similar programs among the nations:
  – Upgrade of rifles.
  – Procurement of the same type of accessories (sights, laser pointers and magnification devices).
  – Studies of light weight fire control systems.
  – Studies of suppressors.
Assault rifle development

1942
MKb 42 (H)

2009
FN Mk 16 (SCAR-L)

What has happened in the last 67 years?
• Reduced caliber
• Rails
• Foldable and adjustable butt stock
• Reduced weight
Accessories that were not available 30 years ago

- Good electro-optic day and night sights.
- Laser pointers
- Overhead weapon stations
- Compact fire control systems
- LED flash lights

Aimpoint CompM4  ITT AN/PVS-14  Raytheon AN/PVS-13 TWS  Laser Devices DBAL-A2  Rheinmetall LLM 01

Kongsberg Protector  Aimpoint FCS BR8  Streamlight TLR-1  IT AN/PAQ-4C
Small Arms Lethality

- There has previously been many discussions about small arms lethality.
- GBR therefore hosted a two day ”Workshop on Small Arms Lethality” on February 18-19 at the Defence Academy of the United Kingdom in Shrivenham.
- The group agrees that shot placement is the most important parameter.
- This is achieved through good and realistic training.
- We have included this topic in our agenda.
Modification of Swedish pop-up target

Original target

Modified target

Sheet metal (w=120mm)

Cardboard
Questions?