

CANADIAN ARMY PORTABLE WEAPONS FUTURE NEEDS & CAPABILITIES



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NATO LCG 1 Weapons and Sensors Team
NATO Task Group SCI-178 / RTG-043 Dismounted Soldier System Weapon Systems
Project Director: Small Arms Replacement Project 2 (DMS 00001428)
& Sniper Systems Project (DMS 00001001)



Gouvernement
du Canada

Government
of Canada

Canada

OUTLINE

- **Capability Deficiencies**
- **Upgrades and Capital Projects**
- **In-service Equipment**
- **Research & Development**
- **NATO Initiatives**
- **SARP 2**

CAPABILITY DEFICIENCIES

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WEIGHT ON OPERATIONS

Average Canadian Soldier is 82 kg

- **32% of 82 kg = 26.2 kg**
- **Ammo and Weapons – 9 kg**
- **Ballistic Protection – 10 kg**
- **Clothing, Indiv Eqpt, Load Carriage – 9 kg**
- **Radio, NVGs, LAD, GPS + batteries – 6 kg**
- **Water – 3 kg**

TOTAL – 37kg + at temp above 40C

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POWER ON OPERATIONS

- AN/PVS-14 NVG (1 AA battery)
- Maglite (2 AA battery)
- PRR (2 AA battery)
- GPS (3 AA battery)
- EOTech Holographic Sight (2 AA battery)
- AN/PVS-505 Kite Sight (2 AA battery)
- AN/PAC-4C model 7500 Laser Pointer (2 AA battery)
- Insight M3X Tactical Flashlight (2 Li-ion CR123A batteries)
- BCID Beacon - TAG IR (1AA battery)
- Spares – Mission duration dependant
- TOTAL –**At least 15 AA and 2 CR123 batteries daily**

Op MEDUSA, Supply shipped over 17500 AA batteries to one Infantry company alone, in the space of 2 weeks!

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Current Capability Deficiencies

- **Lethality:** does not defeat increased personal protection
- **Ammunition:** Minimal multi-effects and few non-lethal capabilities
- **Accuracy:** Requires significant level of training for effect
- **Inconsistent Visibility:** Even with viewing aids, visibility by day/night is different.
- **Signature Management:** Noise/flash are distinctive.
- **Integration/Networking:** No direct link to the Soldier System
- **Adaptive Dispersed Operations (ADO):** Difficulty in integrating current small arms into the net-enabled and dispersed concept of ADO
- **Ergonomics:** Poor weight, compactness and operating commonality
- **Ancillaries:** Ancillaries available but not integrated.

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WEAPONS UPGRADES AND CAPITAL PROJECTS

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C7 Mid-life upgrade



- Start: 2003
- Fielding priority: Army Managed Readiness Plan
- Fielding: >30,000 Issued, Regular Army, CTC + Area Training Centres, & 2 Tac Hel Sqns complete
- Production Increased to 9000 per year will increase to 12000 1 Apr 10
- Current Phase:
 - Conversion of Army Reserve started 1 May 2009, east to west by LF Area
 - Estimate LFAA complete by Early Fall 09 & SQFT complete by Mar 2010
 - All Reserves complete by May 2011

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C8 Mid-life upgrade

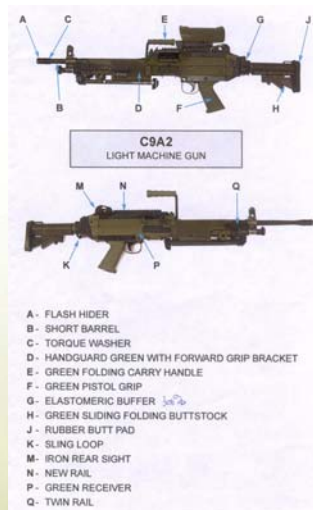


- Start: 2004
- Fielding priority: Army Managed Readiness Plan
- Fielding: 3,000 Issued, Regular Army – for specialist purposes
- Current Phase:
 - Formally clarifying the requirement
 - All C8 versions to C8A3 complete by 2012

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C9 Upgrade

- Start: 2008
- Fielding priority: Army Managed Readiness Plan
 - TF 3-08, TF 1-09 & TF 3-09 complete
 - TF 1-10 to start summer 09
- All C9s converted to C9A2 by 2012



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M72 Upgrade

- **Original anti-armour version introduced in the 1960s**
- **Anti Structure Munition**
 - Entering system in FY 09/10
 - Stocks to be 60/40 split in favour of ASM
 - S³ testing in progress



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84mm Upgrade

- **Original 84mm Anti-armour ammunition and launchers introduced in the late 1960s**
- **Lightweight Launchers**
 - 100 acquired in the late 1980s, additional launchers acquired 2008
 - Improved Optical sights acquired 2007
- **High Explosive Dual Purpose (anti-structure) ammunition acquired 1988**
- **Improved anti-armour ammunition acquired 2008**
- **High Explosive Anti-Personnel ammunition to be delivered Fall 2009**
- **Smoke, Illumination and other natures to be introduced starting in 2010**



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Project Updates

- **Close Area Suppression Weapon**

- Intent

- The CASW project will provide the battle group with modern integral support weapon that possesses a precision fire control system able to fire in direct, indirect and airburst mode meet the demands of the anticipated future battle space.



GDATP Mk47 Striker40 AGL



Heckler & Koch 40mm GMG (Granat MaschinenGewehr)



CIS (Chartered Industries of Singapore) 40x42

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Project Updates

- **PMEWS**

- Intent

- PMEWS will provide a man portable multiple effects weapon system that will be distributed to all organizational levels. It will be an organic, versatile, highly responsive direct fire capability with flexible terminal effects and delivery characteristics and other special features.

- Activity

- Options Analyse about to be sent on circ
 - FCS trial this winter (TBC)



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Project Updates

- **ALAWS**

- Intent

- The ALAWS project will address the current deficiency associated with range by introducing a dismounted weapons system that can engage armoured vehicles, as well as strong points such as bunkers, caves and buildings with a high degree of accuracy to minimize collateral damage and at the same time ensure a high degree of survivability of the crew.



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Project Updates

- **Sniper Systems**

- Intent

- to provide a complete and fully integrated system of sniper equipment from clothing, camouflage, sensors, communications, weapons, night vision equipment, to transportation.



- Activity

- SS(EPA) Fall 2009

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IN-SERVICE CF EQUIPMENT

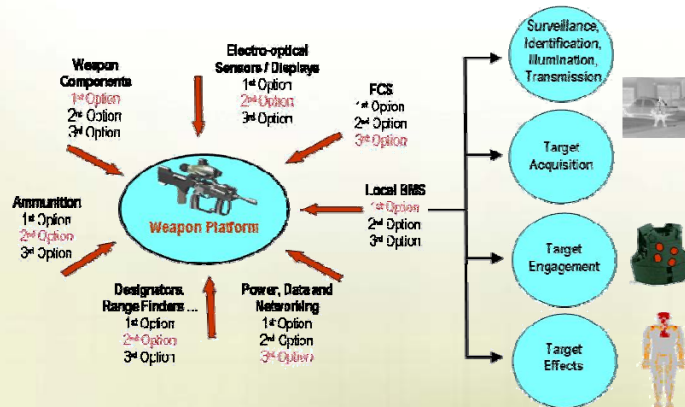
CANADIAN FORCES SMALL ARMS - MENU
ARMES LÉGÈRES DES FORCES CANADIENNES - MENU

 <p>+71280* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71281* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71282* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71283* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71284* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71285* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71286* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71287* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71288* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71289* M16A1, 5.56mm NATO, M16A1, M16A1</p>	 <p>+71289* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71290* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71291* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71292* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71293* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71294* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71295* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71296* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71297* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71298* M16A1, 5.56mm NATO, M16A1, M16A1</p>	 <p>+71299* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71300* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71301* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71302* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71303* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71304* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71305* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71306* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71307* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71308* M16A1, 5.56mm NATO, M16A1, M16A1</p>	 <p>+71309* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71310* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71311* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71312* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71313* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71314* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71315* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71316* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71317* M16A1, 5.56mm NATO, M16A1, M16A1</p>  <p>+71318* M16A1, 5.56mm NATO, M16A1, M16A1</p>
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RESEARCH & DEVELOPMENT

SIPES TDP

Small arms functional prototypes based on component technologies that are optimally integrated to maximize weapon system effectiveness. A systems approach will be used to select component technologies based on **Analytical Hierarchy Procedure** and **Human Systems Integration** principles. **Operational Analysis** will be used to predict and assess weapon systems options.



NATO INITIATIVES

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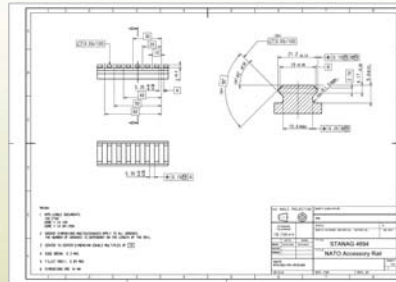
NATO Research & Development

- **NATO Future Small Arms RTO**
 - 3 Sub Groups
 - Technical Interfaces
 - Power
 - Human Factors
 - Reports to be completed by Dec 2009
 - Most will be published openly
 - 1 STANAG already approved

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NATO Research & Development

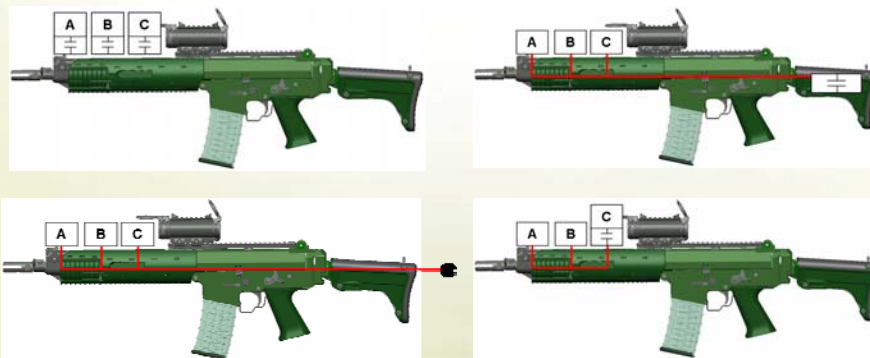
- **Technical Interfaces**
 - NATO Accessory Rail (STANAG 4694)
 - Flash hider thread
 - Flash hider external dimension (22mm)
 - Bayonet interface



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NATO Research & Development

- **Power Sub Team**
 - Power distribution on the weapon



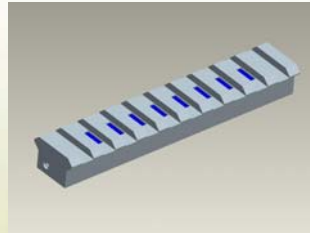
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NATO Research & Development

- **Conductive**



- **Inductive**



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NATO Research & Development

- **Human Factors**

- Bio mechanics
- Weight and balance
- Man/Protective Equipment/weapon interface

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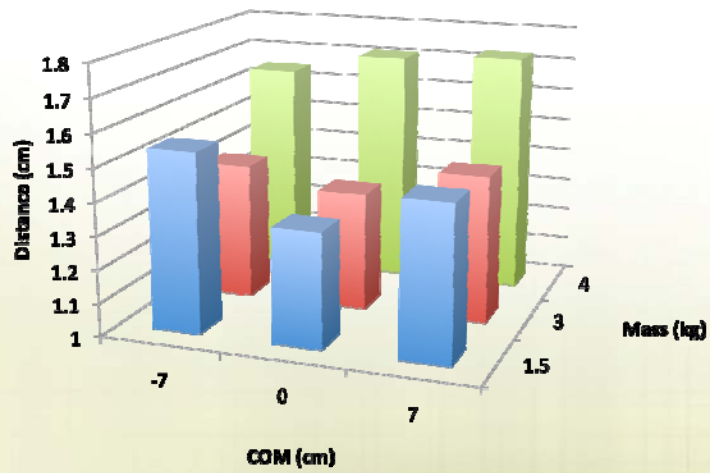
NATO Research & Development



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NATO Research & Development

Rifle Tracking During Fine Aiming



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**FUTURE REQUIREMENTS
- SMALL ARMS
REPLACEMENT PROJECT 2**

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Goal

- **SARP 2 will modernize or replace the CF small arm capability**

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SARP 2

- **Value \$1.0 Billion to 1.4 Billion**
- **Three phases**
- **Phase 1 (Tentative 2012-2015)**
 - Pistol, Ranger Rifle, Grenade Launcher, Shotguns (Breaching)
- **Phase 2 (Tentative 2015-2018)**
 - PDW, Other Service weapons, Light Vehicle Armament System
- **Phase 3 (Tentative 2018-2022)**
 - Infantry Assault Weapons

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SARP 2 Major Issues

- **Coordination with Integrated Soldier System Project (ISSP)**
- **New operational concepts - ADO**
- **US Army/NATO decision on calibres**
- **Evaluation of Terminal Ballistics performance**
- **Reducing the training requirement**
- **What parts of the soldier system are to be weapon mounted & why**

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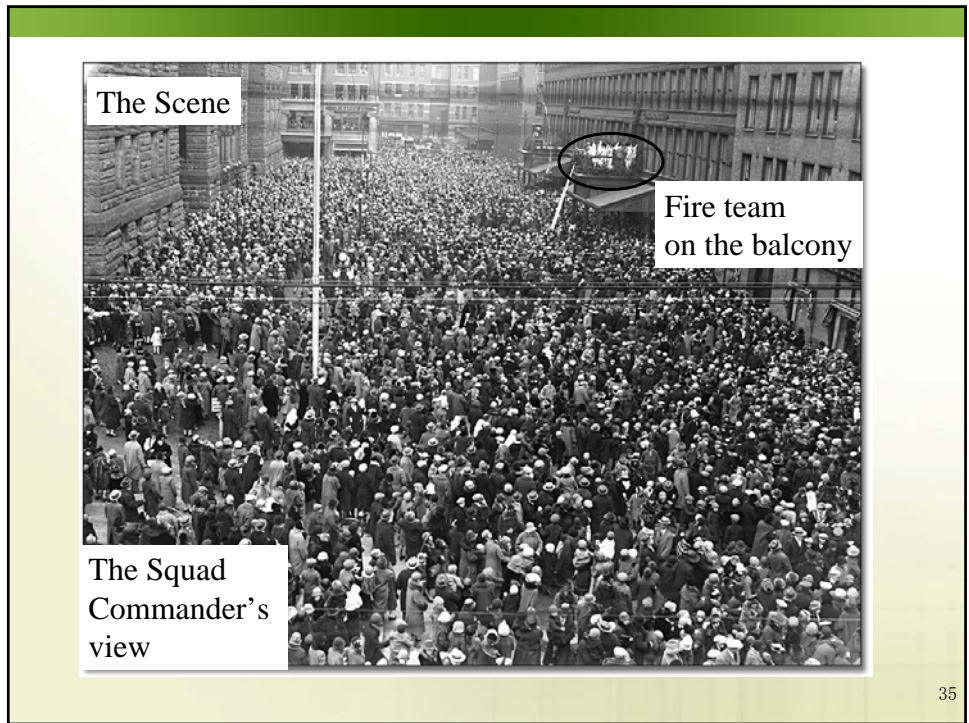
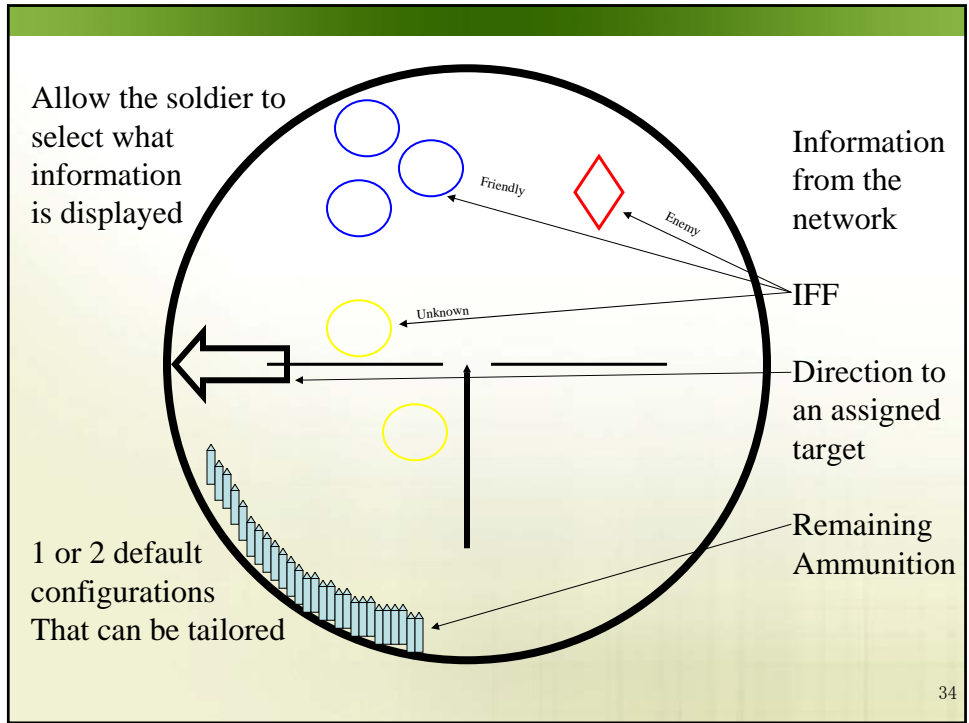
Weapons and the Network

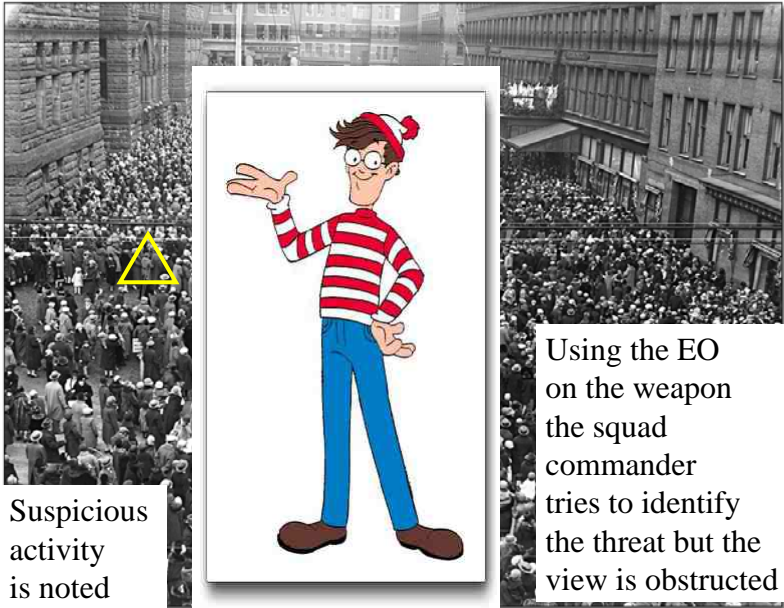
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Weapons and the Network: Designation and continuous transfer of the objective

- **The weapon is already the location for sensors and electronic devices**
- **Pointing with a weapon is natural for a soldier**
 - Export information used by accurate pointing
 - Use the Battle Management System to help the soldier locate the tgt in the weapon sights
- **Accurate pointing can be used to enhance the squad SA if the EO devices export information & images to the network**
 - Need to be geo-referenced
 - Time stamped

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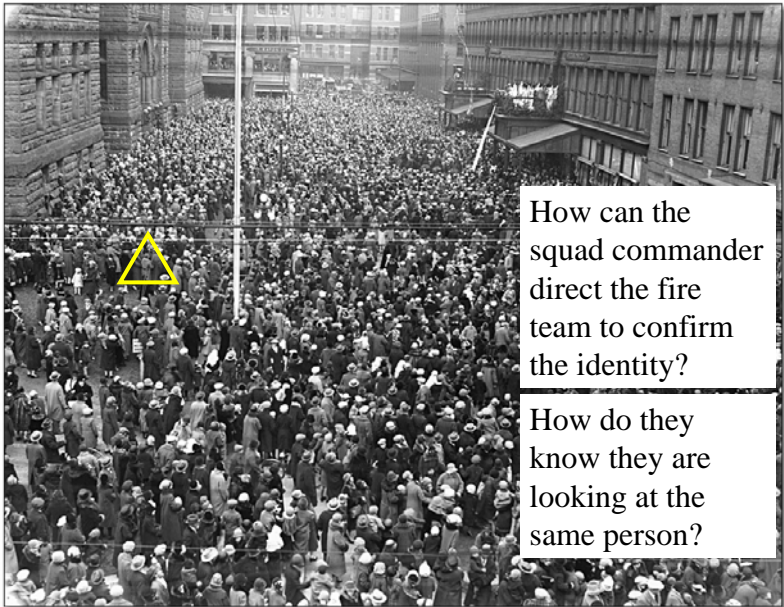




Suspicious activity is noted

Using the EO on the weapon the squad commander tries to identify the threat but the view is obstructed

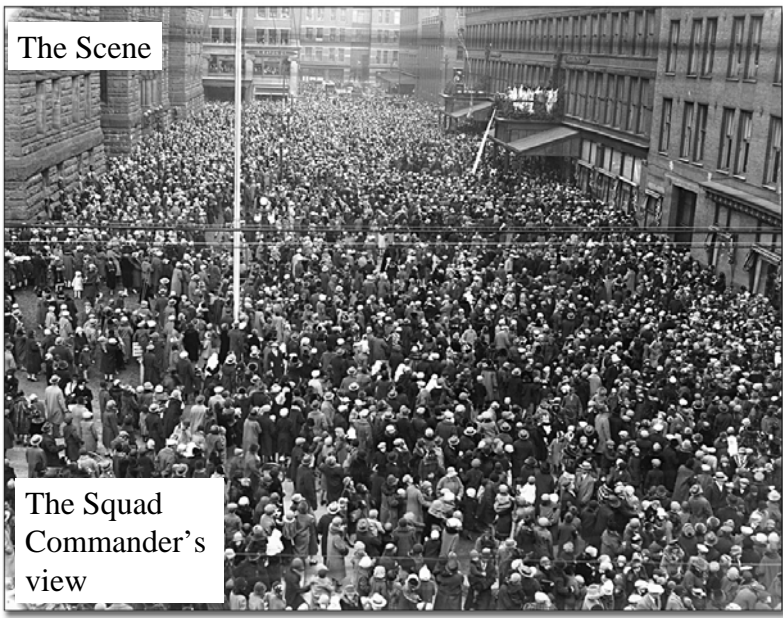
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How can the squad commander direct the fire team to confirm the identity?

How do they know they are looking at the same person?

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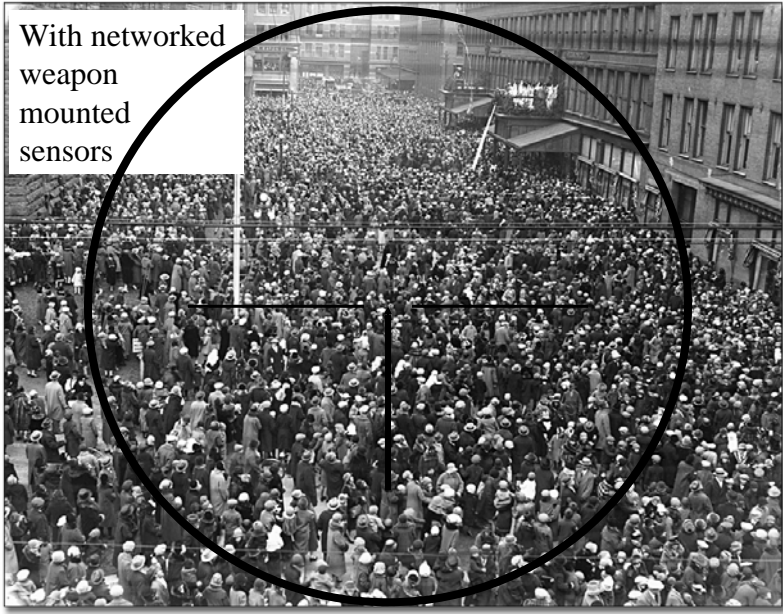
The Scene

The Squad
Commander's
view

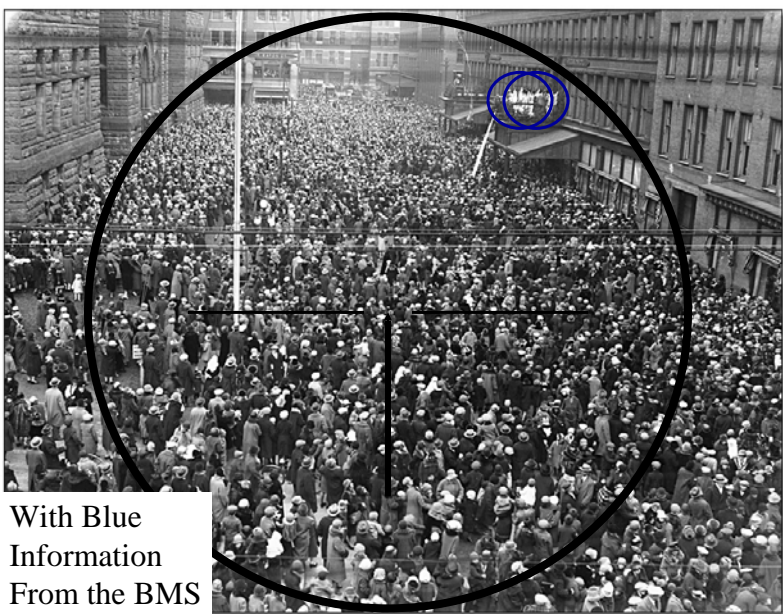


The Scene

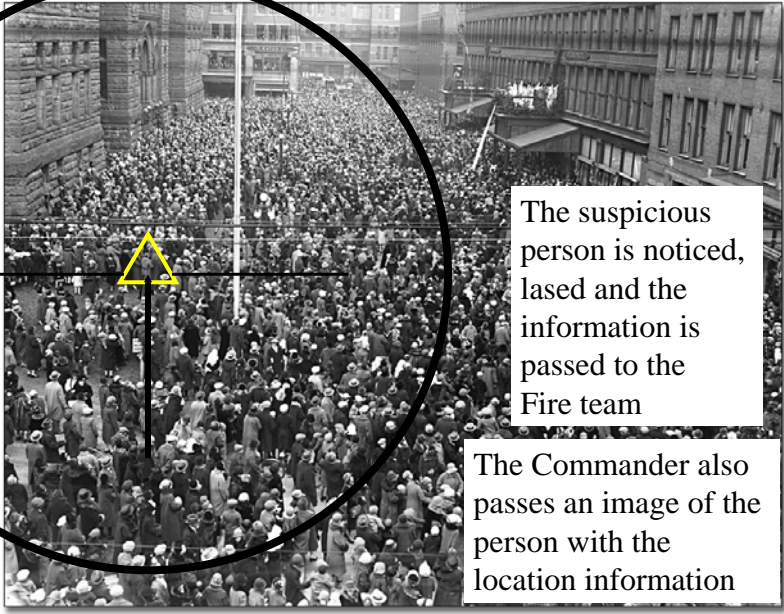
The Fire Team's
view



With networked
weapon
mounted
sensors



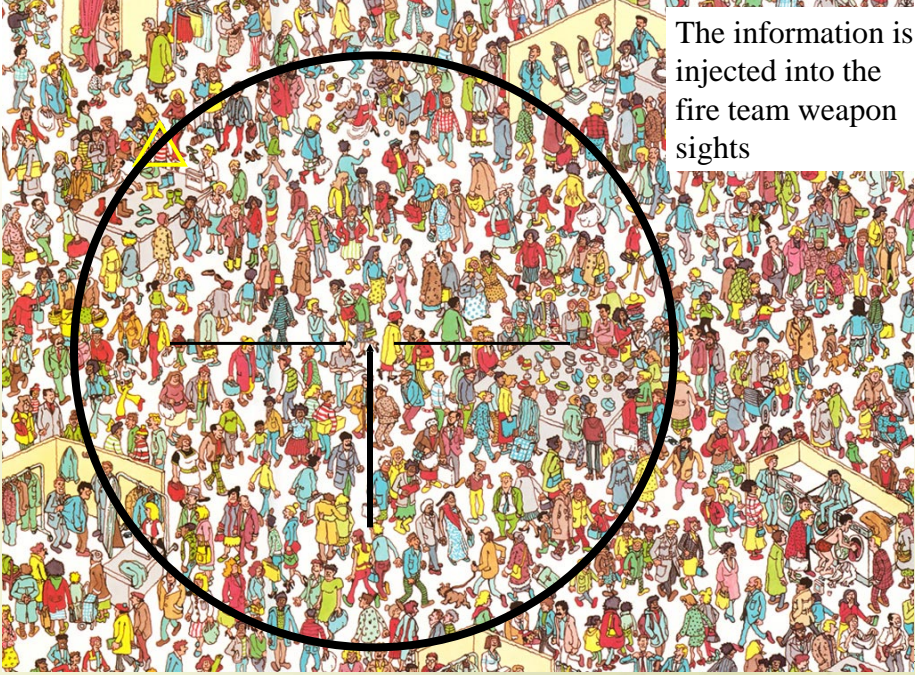
With Blue
Information
From the BMS



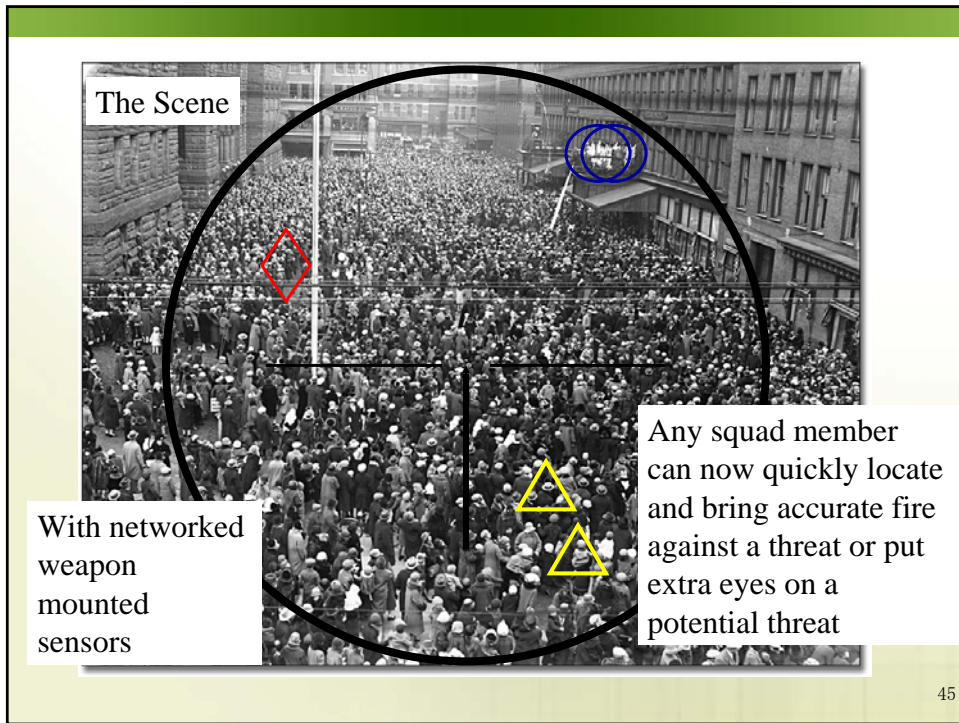
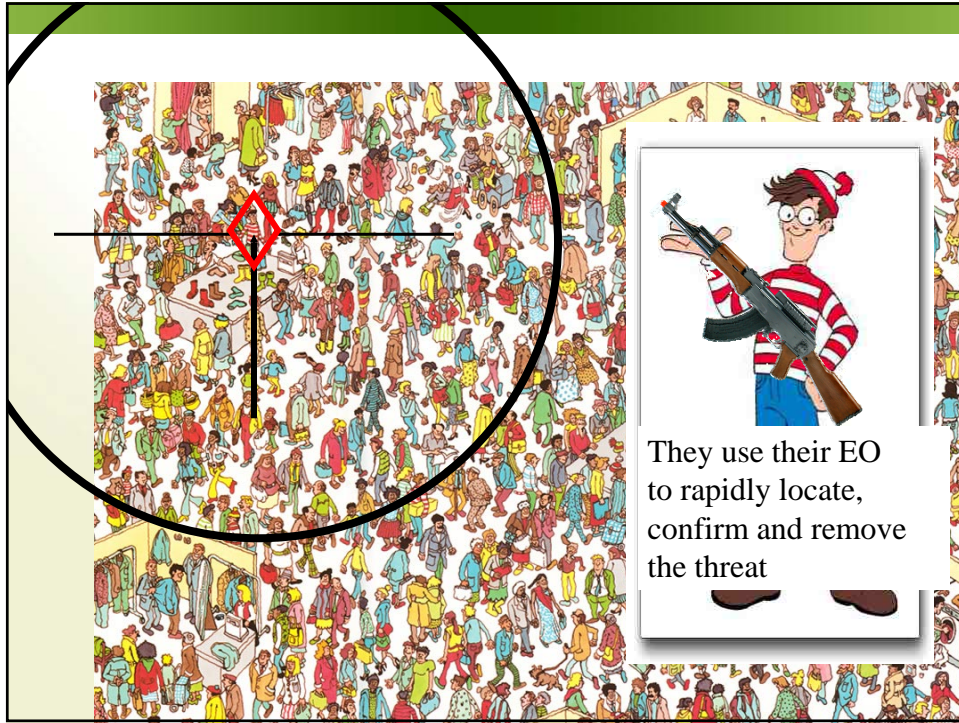
The suspicious person is noticed, lased and the information is passed to the Fire team

The Commander also passes an image of the person with the location information

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The information is injected into the fire team weapon sights



**Requirement
on the
precision
capability:
Concept –
Automated
engagement
of the target**



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Summary

- **SARP 2 will be a science based project requiring:**
 - Long term scientific effort
 - Collaborative Effort DRDC + DLR + Industry guided by an R&D Plan
 - Close integration with the products of existing projects
- **SARP 2 will integrate the weapon with the soldier system**
- **The networked weapon will enhance soldier lethality and precision**

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Questions?

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