Canadian Forces
Project Land Force ISTAR

Mr David Connell

Department of National Defence

Intelligence, Surveillance, Target Acquisition and Reconnaissance
Report Documentation Page

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Presentation Outline

- What is ISTAR?
- Deficiencies
- Options Examined
- Deliverables
- Schedule
- STANAG 4586 and the Canadian effort
- EX ROBUST RAM, ISTAR and the Pointer UAV lessons learned
What is LF ISTAR?

Common Operating Picture (CFCS)

CFISR

Recognized Maritime Picture

Recognized Land Picture

LFC2TS

BLUE SA

Recognized Air Picture

LF ISTAR

BROWN SA + RED SA
## Capability Deficiencies

<table>
<thead>
<tr>
<th>Communications</th>
<th>C2</th>
<th>Sensors</th>
</tr>
</thead>
<tbody>
<tr>
<td>✗ Lack bandwidth to distribute data &amp; information</td>
<td>✗ Limited, makeshift access to national &amp; Allied ISR data</td>
<td>✗ Existing general-purpose sensors not integrated</td>
</tr>
<tr>
<td>✗ Can not download data from aerial vehicles</td>
<td>✗ No tactical level reliability or repeatability for intelligence products</td>
<td>✗ Limited capability of tactical EW sensors</td>
</tr>
<tr>
<td></td>
<td>✗ No tactical level ISTAR facility to support C2</td>
<td>✗ No capability to conduct reconnaissance beyond line of sight</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✗ No capability to detect and locate source of hostile indirect fire</td>
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</tbody>
</table>
## Project Phases

<table>
<thead>
<tr>
<th>Identification</th>
<th>Options Analysis</th>
<th>Definition</th>
<th>Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify capability deficiency</td>
<td>Formulate options</td>
<td>Detailed review</td>
<td>Implementation</td>
</tr>
<tr>
<td>Discard invalid options</td>
<td>Risk assessment</td>
<td>Implementation management</td>
<td>Implementation monitoring</td>
</tr>
<tr>
<td>Assess benefits of remaining options</td>
<td>Costing of selected option</td>
<td>Status Reports</td>
<td>Operational Handover</td>
</tr>
<tr>
<td>Examine risk</td>
<td>Implementation planning</td>
<td></td>
<td>Close out</td>
</tr>
<tr>
<td>Decide which option should be pursued</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Development</td>
<td></td>
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</tbody>
</table>
Options Examined

- **Maintain Status Quo.**
  - Unacceptable …

- **Develop specific/custom tailored LF ISTAR components**
  - Not recommended …. This would be a very risky venture requiring huge investments, research and development…several years of development.

- **Acquire Commercial/Military-Off-the-Shelf components**
  - Preferred Solution …. Technologies for information sharing, fusion and analysis are very mature within the commercial business and military industry.
**Tactical Common Datalink (TCDL)**

- Acquire two TCDL systems to integrate within TCCCS
- Conduct experiments to link with ERSTA Griffon, CP-140 Aurora, UAV
- Confirmation of STANAG 7085 requirement

**Tactical UAV Sensors**

- Develop concepts of operation in concert with the Command Support Pilot Project and CF Experimentation Centre
- Define possible payload requirements
- Continue validation of STANAG 4586

**Acquire Risk Reduction Units**

- Conduct integration tests in conjunction with Command Support Pilot Project
- Trial in field environment to define usage methodology
- Definition of tactics, techniques and procedures (TTP) for new equipment
**Project Deliverables**

<table>
<thead>
<tr>
<th>Communications</th>
<th>C2</th>
<th>Sensors</th>
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</thead>
<tbody>
<tr>
<td>Acquire and Integrate</td>
<td>Establish PMO/Configuration Management Facility</td>
<td>Tactical UAV Sensors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Weapon Locating Sensors</td>
</tr>
<tr>
<td>High Capacity Data Radio (HCDR)</td>
<td>ISTAR CMF PMO PMPR (36 pers)</td>
<td>Enhancements to EW Sensors.</td>
</tr>
<tr>
<td>Tactical Common Datalink (TCDL)</td>
<td>Acquire Risk Reduction Units</td>
<td>Enhance Existing Sensors</td>
</tr>
</tbody>
</table>

**Definition Phase Only**
Project Schedule

99/00 00/01 01/02 02/03 03/04 04/05 05/06 06/07 07/08 08/09 09/10 10/11

Definition

Communications & Datalinks
- HCDR
- TCDL

Command & Control Components
- ISTAR C2 (CGW)

EW Sensor Enhancements
- ESM, EA, Fusion & Analysis

New Sensors
- UAV
- CBTA
- LAV 3
- LAV Coyote
- LLAD
- Met System

Legacy Sensors

Project Management Office
STANAG 4586

Standard Interfaces of UAV Control System (UCS) for NATO UAV Interoperability
Canadian International Technology Demonstration Program (ITDP) STANAG 4586 VCS Vehicle Control Panel
Canadian ITDP:

Data Link Interface validation

- Contract start December 2001
- Contract end March 2002 (virtual validation)
- Canadian Forces planning on participating in US operational validation in 2003
Canadian ITDP

CDL Systems Ltd Calgary

Universal Control System (UCS) - Interfaces

- Vehicle Specific Module (VSM)
- Core UCS
- C4I Systems

- "front end" Data Link Interface (DLI)
- "back end" Command and Control Interface (CCI)
- Human-Computer Interface (HCI)

CDL Systems validation effort
Vehicle Specific Module

AAI Corp Shadow 200 (US Army TUAV)  Bombardier CL-327 Guardian
EX ROBUST RAM

Flights 12 - 24 April 02
Western Canada
**Ex Robust Ram - ISTAR Results**

<table>
<thead>
<tr>
<th>Communications</th>
<th>C2</th>
<th>Sensors</th>
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<tbody>
<tr>
<td>Acquire and Integrate</td>
<td>Establish Configuration</td>
<td>Tactical UAV Sensors</td>
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<tr>
<td></td>
<td>Management Facility</td>
<td></td>
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<tr>
<td>High Capacity Data</td>
<td></td>
<td>Enhance Existing Sensors</td>
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<tr>
<td>Radio (HCDR)</td>
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<tr>
<td></td>
<td>ISTAR CMF PMO FMRB</td>
<td></td>
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<tr>
<td></td>
<td>Coyote made network</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ready &amp; linked to Bde</td>
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<tr>
<td></td>
<td>HQ LAN through HCDR &amp;</td>
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<tr>
<td></td>
<td>Microwave link</td>
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<tr>
<td></td>
<td>Pointer UAV tested &amp;</td>
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</tr>
<tr>
<td></td>
<td>linked to Bde HQ LAN</td>
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</tr>
<tr>
<td></td>
<td>through HCDR &amp; Microwave</td>
<td></td>
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<tr>
<td></td>
<td>link</td>
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<tr>
<td></td>
<td>LAV Recce</td>
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</table>
Status - Sub-Tactical UAV

- Pointer UAV is excellent. Easy to operate, quick response (5 minutes between flights) and well suited to Recce Sqn tasks. Despite high winds (35 kts +)…Pointer could always fly … always extend the horizon of forward troops such as Coyote!
Possible Concepts
Combat Team Commander’s Personal Air Patrol
On the Move!
Canadian Forces Project
Land Force ISTAR Contacts

• Project Director
  – Lieutenant Colonel Lee Nickerson

• Project Manager
  – Lieutenant Colonel Allan McPhee

• Deputy Project Manager (UAV)
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