

# Accelerating Land Release

## Mine Detection Dog SMART System

**INNOVATION**

POINT OF VIEW

ANOTHER

FROM

FROM





# Swiss Mine Action Reduction Tool

# The Problem



- Excessive use of clearance resources in areas that may not contain landmines and/or ERW
- Average contamination density between 4-16 items per hectare
- Tens of millions of dollars have been invested in survey since 2009. At large, the global survey efforts did not yield any conclusive data and could have been applied differently
- Up to 300 years to complete with a continued excessive use of clearance assets

# Mine Detection Dogs



2008

- Declining use of dogs due to inefficiency and lack of confidence
- MDD have only been used marginally in technical survey
- Deployment-constraints, including the requirement for prior vegetation cutting, limited search depth by the MDD due to stringent requirements for straight search lanes, two dogs over the same area and the provision of safe access for handlers

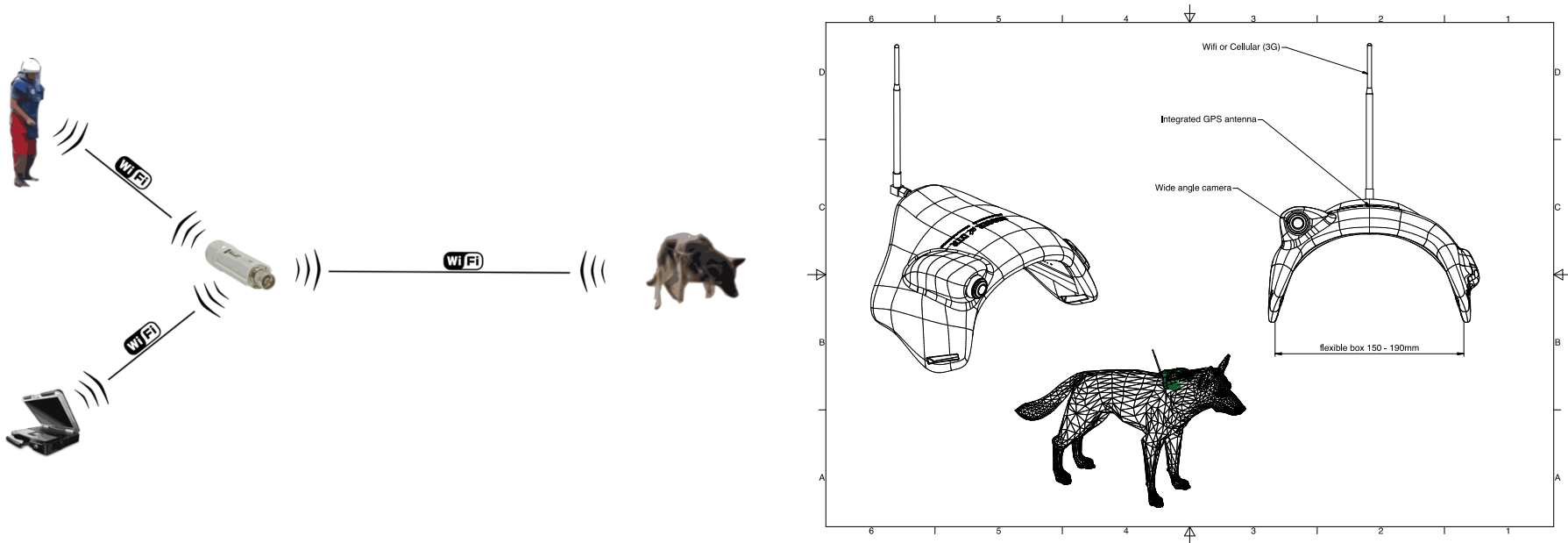


# The Solution



- The idea of free running dogs originates from the hunting concept in Sweden where dogs are used. The Swedish hunting areas are usually 100-300 hectares per hunting team
- Hunting dogs are equipped with a GPS collar so that the handler can monitor the dog on a device
- Drawing from the experience using a free running dog searching for a moose in a big area isn't that different than searching for a mine in a suspected hazardous area
- GICHD initiated the development project with DIGGER and NPA in 2014 with the support of CMAA and CMAC in Cambodia.

# SMART Components



- Dog harness that includes gps, radio and video camera
- Dog handler monitors his free running dog on a smartphone and can communicate via the radio
- The system also offers live feed video, mainly to act as a QA component ensuring that the dog is searching i.e. nose is on the ground
- All communication/ exchange of data is managed via a computer acting as a server over a Wi-Fi hotspot

# Project Findings 2014-2015



- Vegetation does not limit the dogs operability and explosive detection ability
- Some vegetation actually enhances the explosive odor
- Operational distance up to 100m from handler in medium vegetation
- Average TS output up to 4 hectare per day, TS systematic approach 25%
- Accuracy in TS does not require cm precision and battery time can be reduced
- No confidence issues since the product is not “cleared area” but system rather provides a defined “starting point” for further investigation
- Harness should be as light as possible for the dog, preferably between 300-500 grams

# Prototype 2014 vs. Prototype 2015



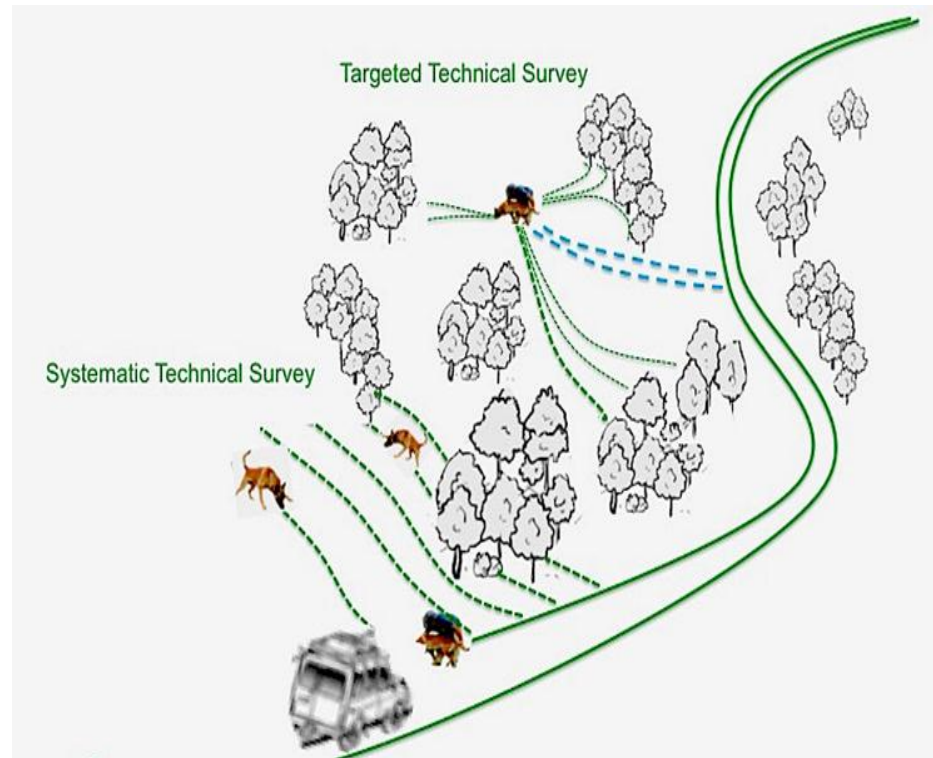
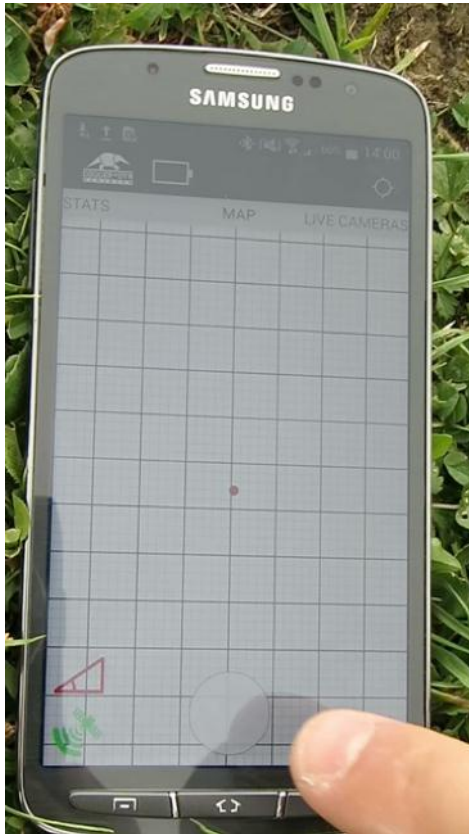
Weight: 2.7 kg  
Accuracy: 50 cm (RTK / DGPS)  
Operating Time: 8 hours



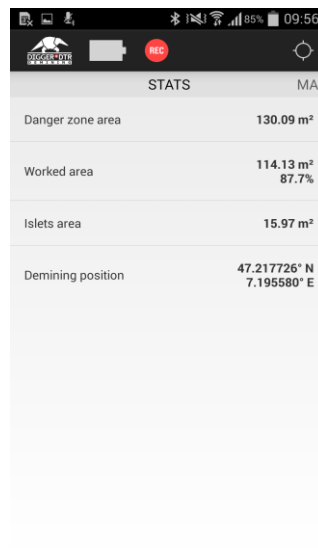
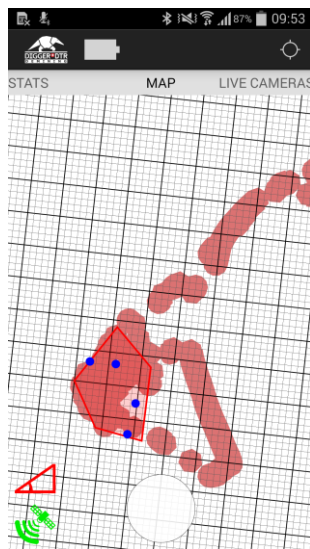
Weight: 0.5 kg  
Accuracy: 5 m (GPS)  
Operating Time: 4 hours



# TS Approach with SMART viewed on a smart phone



# Technical Solution Offers Digital Records



Assignment: CY-Dog  
 Supervisor: Super Vilor  
 Operator: Oper Ateur  
 Demining mean: RealDog  
 Operation: op  
 Date: 24.11.15  
 Organization: Test Org  
 Geographic area: Test Area  
 Total area cleared: 367.437 m<sup>2</sup>  
 Assignment completion: 16.380%

## Sessions summary

Name	Area	Alarms
S854A46	217.382 m <sup>2</sup>	0
S855A46	243.656 m <sup>2</sup>	2

## Downtimes summary

Type	Start at	End at	Comment
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## Alarms details

Alarm ID	Type	Model	Description	Position
B9	UNDEFINED			(47.21699184272 4056, 7.195346304605

### Edit an existing session

General

Session name

HR-First pass-002

Operation

First pass

Supervisor

Thomas Della Piazza

Operator

Steve Glascer

Tool

Demining machine

Name

Dog1

Time

Local time zone

+01:00

Local start date

26 août 2014 11h 41m

Local end date

26 août 2014 12h 19m

Total duration

0h 37m

Clearing constraints

Min tool depth

20.0 cm

Min overlap

10.0 cm

Max speed

1.0 km/h

Max target size

3.0 cm

Session comment

Test session on exercise field with buried targets. Coverage and system functions in very dense vegetation has been tested.  
 The test resulted in a full functional system even under dense vegetation cover but with less absolute GPS precision.

Clearing results

Area cleared

153.05 m<sup>2</sup>

Destroyed mines list during session

ID	Date	Mine type	Mine description
44.2014-08-26T11:14	UNDEFINED	Bullet fragment	
45.2014-08-26T12:0	UNDEFINED	Buried cluster m.	
46.2014-08-26T12:0	UNDEFINED		
47.2014-08-26T12:0	UNDEFINED		

Mine information

Destruction date

26.08.2014 - 11:48:32

Location

18.364995463946425 E, 43.906118629821184 N

Mine type

UNDEFINED

Mine description

Bullet fragment

Mine comment

Alarm produced by bullet fragment.

Upon completion of the task all data recorded by the system can be used to generate a report – “Push and Send” instantly

# What's Next 2016

- Production of 20 SMART systems have started
- The SMART systems will be donated to MDD organisations / operators after request
- World Without Mines will fund the SMART Systems
- DIGGER will build the SMART systems



WELT OHNE MINEN  
WORLD WITHOUT MINES  
MONDE SANS MINES



# QUESTIONS?





[www.gichd.org](http://www.gichd.org)