## EYES IN THE SKY: Airborne and Satellite Reconnaissance for UN Peacekeeping



Dr. Walter Dorn 27 January 2010



"Concern for man himself and his fate [humanity itself and its fate] should be the chief interest of all technical endeavors. Never forget this in the midst of your diagrams and equations."

– Albert Einstein

### Peacekeeping: First 50 Years



Map No. 3852.1(E) Rev. 17 UNITED NATIONS March 1999 Department of Public Information Cartographic Section

## Peacekeeping Today

### MISSIONS ADMINISTERED BY THE DEPARTMENT OF PEACEKEEPING OPERATIONS



# Monitoring tasks

- Cease-fires
  - Early warning
- Peace agreements
  - DDR and SSR
- Armed groups and spoilers
- Protected areas and persons
- Humanitarian conditions & relief
- Elections and human rights
- Sanctions and no fly-zones
- Resource exploitation
- Safety & security of UN personnel

"A MONITORING GAP"

## **Traditional Tools**

The Human Eye ... sometimes aided by binoculars



### Ground-based



## **Observation Tower**



## **Problems of Unaided Monitoring**

Limited capabilities ...

- over large areas
- at night
- for underground detection
- in remote/difficult terrain
- information recording, analyzing, sharing and storage

## Benefits of Monitoring Technologies

- Increases range and accuracy of observation
- Permits continuous monitoring
- Increases *effectiveness* (including *costeffectiveness* in some cases)
- Decreases intrusiveness
- Enhances safety of staff in field
- Provides recordings/evidence



# Satellite Observation

Africa (Congo and Darfur)

### **Zaire 1996**

### **RADARSAT-1**

### HUMANITARIAN ASSISTANCE



© Canadian Space Agency / Agence spatiale canadianne 1996. Data received by the Canada Centre for Remote Sensing. Processed and distributed by BADARSAT International

CENTRAL AFRICA - REFUGEE ACTIVITY November 12 & 22, 1996 Fine 2 & Standard 4



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Dorn

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JOIN US SEND TO A FRIEND

| HOME  | SATELLITE EVIDENCE   | VILLAGES AT RISK              | THE CRISIS | TAKE ACTION | ABOUT THE PROJECT | PRESS |
|---|--|-------------------------------|------------|-------------|-------------------|-------|
| Donkey Dereis<br>Attack Summary<br>Location: South Dartur<br>Attacked: April 2006<br>Destroyed Homes/Structures: 45<br>Likely Damaged/Destroyed<br>Structures: 11 |  |                               |            |             |                   |       |
| Hide<br>De<br>De  | edestroyed structures<br>estroyed Structures: 45<br>ady Damaged<br>estroyed Structures: 11 | Before Attack<br>After Attack |            |             |                   |       |

Satellite image taken October 20, 2006

a zoom out

view/download detailed image 🔂



# Aerial Observation in Selected UN Missions

Cyprus D.R. Congo Haiti



United Nations Peacekeeping Force in Cyprus (UNFICYP)



Map No. 2950 Rev. 68E UNITED NATIONS November 2009 (Calour)



# NO PHOTOGRAPHS, VIDEO OR FILMING TO BE TAKEN BEYOND THIS POINT

ΑΠΑΓΟΡΕΥΕΤΑΙ Η ΛΗΨΗ ΦΩΤΟΓΡΑΦΙΩΝ Η ΒΙΝΤΕΟΓΡΑΦΗΣΗ & ΚΙΝΗΜΑΤΟΓΡΑΦΗΣΗ ΠΕΡΑΝ ΑΠΟ ΤΟ ΣΗΜΕΙΟ ΑΥΤΟ 2009











Photos by W. Dorn

## Detecting Violations: Illegal farming in former minefield



## Non-announced military briefing at new bunker



## Extra Benefit: Oblique Viewing





### MONUC:

United Nations Mission in the Democratic Republic of the Congo



# Imagery from MI-35 sensors

MI-35 Attack helicopter (AH) during the attack on Goma September 2008

Draft Photo credits: MONUC

## **MI-35 Attack Helicopter**





### Front View; MI-35 in MONUC, No.104 Helicopter Unit of the Indian Air Force, 21 January 2006;

URL: <u>http://www.bharat-</u> rakshak.com/IAF/Images/Special/Features/Congo/Photo\_2006123102447578.j

pg.html

#### Side view

"UN Helicopter on Aerial Patrol An MI-24 [export version: MI-35] helicopter of the United Nations Mission in Liberia (UNMIL) on aerial patrol in search of the illegal marijuana plantations. 17 September 2008, Monrovia, Liberia" View of a CNDP rebel running with weapons in the period when CNDP's attempted to attack Goma. Image is a screen capture from the Mi-35's television camera. (The camera resolution is better than shown in this image.)



Forward-looking Infrared (FLIR) camera freeze frame showing two suspected rebels approaching a vehicle on road



## **UAV Support from EUFOR (2006)**



- Dugout canoes filled with small arms moving across Congo river to Bemba forces

 Tanks being shipped by rail to Kabila's army



# Piloting the UAV







Israeli



### Australian



Japanese



# Haiti – Aerial Recce Essential

United Nations Stabilization Mission in Haiti (MINUSTAH)

> 2007 2009 2010
## Haiti - Dom Rep border



Source: NASA, Landsat-5/TM (05/13/1998)

### MINUSTAH Patrolled Areas

**BOIS NEUF** 

Lintheau I

Coast Patrols

DROUILLARD

**CITE SOLEIL** 

Ti Haiti

**BROOKLIN** 

Lintheau II

Norway

Will FTDL

These they

**BELECOU** 

Coast Patrols SOLEIL 4

Blanchard (Cite Gerard)

Cite Lumiere

Trois 👌 Bebes

BOSTON













## December 2008





















Uruguayan CASA-212 Aviocar for observation, transport, medevac (Dorn in khaki pants)

TIOS

RUGUAY

UN-146



### Following Aircraft

P.











## Intelligence

S





## MINUSTAH HQ (15 JAN 2010)



## Dedication



# Haiti Imagery from Google Earth

W. Dorn 20 January 2010

# GeoEye (Jan 13)



http://www.geoeye.com/CorpSite/gallery/detail.aspx?iid=288&gid=20

# GeoEye (Jan 16)



http://www.geoeye.com/CorpSite/gallery/detail.aspx?iid=289&gid=1

## GoogleEarth (Jacmel Airport)

Select date

# Landing Strip Length:End to end:4,050 ft (1,235 m)Non-white strip:3,300 ft (1,010 m)

Jacmel, Haiti

 Min Takeoff Distance (min weight):

 C-130:
 1,400 ft

 C-17:
 3,000 ft (max weigh: 7,600 ft)

Image © 2010 GeoEye



Imagery Date: Feb 26, 2004

18°14'15.87" N 72°31'22.90" W elev 0 m

Eye alt 3.15 km

# **UNOSAT Images**

#### UNOSAT is the

UN Institute for Training and Research (UNITAR) Operational Satellite Applications Programme, implemented in co-operation with the European Organization for Nuclear Research (CERN)

## **Overview: UN Technological Status**

#### Satellite imagery

- Not real time limited operational utility
  - Mapping
  - MacDonald, Dettwiler & Assoc. (MDA)
  - SAR not used
- Aerial imagery
  - Real time transmission to MINUSTAH Hq
  - MI-35 sensors

Some nations in some missions have advanced technology

Moving from cartography to GIS

## "Tools of the Trade?"

#### Conclusions

 No technological fix ... but airborne surveillance technology can be of immense value in monitoring, preventing and mitigating conflict.

2. Technical monitoring can increase the safety and security of peacekeepers as well as the effectiveness of the mission.

3. Technologically advanced nations are needed to provide such force enablers.

#### **Contribution of Uniformed Personnel to PKOs:**

OECD and Non-OECD Nations



### **Special Committee on Peacekeeping**



UN Photo/Paulo Filgueiras



#### **MONITORING AND SURVEILLANCE TECHNOLOGIES**

Tools of the Trade? (independent commissioned report)



#### **2007 Substantive Session**

45. The Special Committee welcomes the study launched by the Secretariat on the use of advanced monitoring and surveillance technologies to tangibly improve operational capabilities, achieve results in the field and promote the safety and security of peacekeeping personnel. Recognizing the urgent need for Peacekeeping Operations to standardize the use of advanced technology, particularly in missions operating in dangerous environments or mandated with challenging tasks, the Special Committee requests the Secretariat to develop appropriate modalities for the use of advanced monitoring and surveillance technologies with due attention to legal, operational, technical and financial considerations as well as the consent of the countries concerned with regards to their application in the field.

Report of the Special Committee on Peacekeeping, 23 May 2007; UN Doc. A/61/19


#### **2009 Substantive Session**

42. The Special Committee notes the progress made towards a wider and systemic use of technology in peacekeeping operations. However, the Special Committee believes further progress is required. In this regard, the Special Committee requests the development of a United Nations **policy** on monitoring and surveillance technology, and looks forward to a <u>report</u> on this subject within six months of the issuance of this Committee's findings. The Special Committee believes that due attention should be given to legal, operational, technical and financial considerations and especially the consent of the countries concerned with regard to their application in the field.

# **Challenges and Opportunities**

### Political

- Host state
- Sharing info
- Privacy
- "Shutter control" rules

#### Personnel

- Operators and analysts and users
  - Training
  - Deployment

### Financial/Physical

• Life cycle: Purchase, Maintenance, Storage

Aerospace monitoring technologies are not yet "tools of the trade," but they can and should be.

# Canada

"Key enabler"
"Force multipliers"

### Expertise

- Remote sensing community
- Peacekeeping experience



## IF THIS TECHNOLOGY-AIDED

### **PRESENTATION DIDN'T WORK ...**

## <u>FORGET</u> EVERYTHING I SAID

# QUESTIONS,

## COMMENTS,

DISCUSSION