



ISR SERVICE PROVIDER SATCOM USE & REQUIREMENTS



TOPICS



- INTRODUCTION
- CAE COMPANY OVERVIEW
- ISR* SERVICES
- ISR SATCOM REQUIREMENTS
- ISR SATCOM ISSUES
- CONCLUSIONS

*ISR = Intelligence, Surveillance & Reconnaissance

CAE COMPANY OVERVIEW

- LUXEMBOURG COMPANY - CREATED IN 1971
- 30 AIRCRAFT - 160+ EMPLOYEES (incl 67 PILOTS – 65 TASK SPECIALISTS)
- 55 Mio EUR TURNOVER IN 2018
- CORE-BUSINESS : CUSTOMISED AIR SUPPORT (AERIAL WORK)

- DEPARTMENTS

- AGSR *ISR /ISTAR SERVICES (+/- 10.000 Hrs/Yr)*
- ASO *AERIAL SURVEY & GEOSENSING SERVICES*
- MPTC *MILITARY AIRBORNE FORCES TRAINING CAMP*
- CAVOK *EASA 145-147-21 + WESCAM SERVICE CENTER*



- LUX / NATO / EU CONFIDENTIAL COMPANY SECURITY CLEARANCE

- MAIN CUSTOMERS

- NATO / EUROPEAN UNION
- SEVERAL EU & NATO GOVERNMENTS & MoD's
- WORLDs TOP GEOPHYSICAL COMPANIES

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CAE COMPANY OVERVIEW

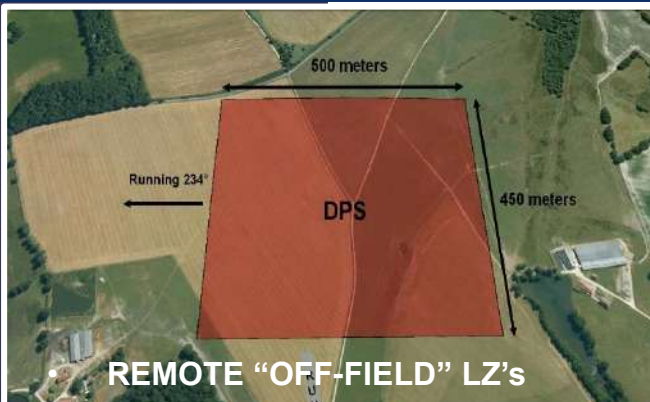
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CAE COMPANY OVERVIEW

MILITARY PARA TRAINING CAMP (MPTC) - LAPALISSE (FR)

- MILITARY PARACHUTING TRAINING FACILITY
- INFRASTRUCTURE – AIRCRAFT - MANAGEMENT & LOGISTICS



• REMOTE "OFF-FIELD" LZ's



CONTRACTOR of DUTCH MoD; FRENCH MoD; UK MoD; GERMAN MoD; US SOCOM, ...

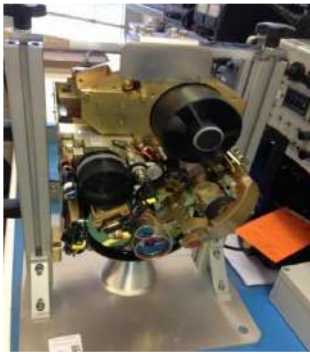
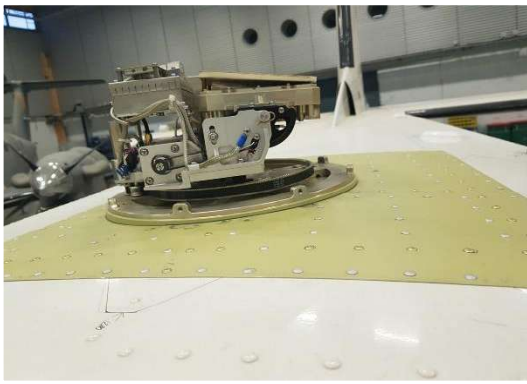
CAE COMPANY OVERVIEW

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AIRCRAFT MODIFICATION & CERTIFICATION

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THIRD PARTY MODIFICATIONS & TRAINING

- **AIRCRAFT INSTALLATION + TRAINING COURSES FOR MSO/IMINT**
 - SEYCHELLES AIR WING DHC6 TWIN OTTER
 - SEYCHELLES AIR FORCE DORNIER Do228
 - KENYAN AIR FORCE Y-12's (02ea)
 - MAURETANIAN AIR FORCE BT67 TURBO DAKOTA



ISR OPERATIONS

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ISR



MARITIME ISR

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OVERLAND ISR

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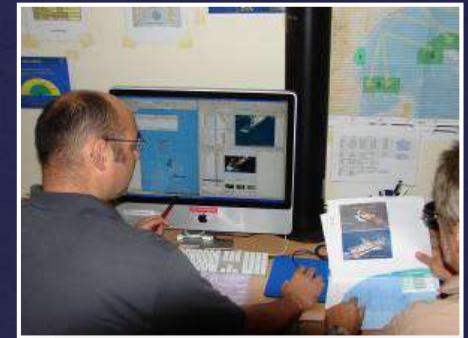


IMPORTANCE OF SATCOM

CAE AVIATION has organic cells with experienced IMINT ANALYSTS, either at the Forward Operating Base, the Customer HQ or in the aircraft:

KEY FACTOR FOR THEM IS REAL TIME SITUATIONAL AWARENESS

- INTELL update to aircrew
- Mission Planning from ATOs
- Geo Support to aircrew
- **Real Time Flight Following**
- **Real Time Re-tasking & INTELL updating**
- **Real Time Analysis and Reporting**
- Mission Debriefing
- Post Mission Analysis
- **Post Mission Reporting and Dissemination**
- Archiving



NOTE: IMINT ANALYSTS SOMETIMES PROVIDED BY THE CUSTOMER

LINE OF SIGHT FMV DOWNLINK

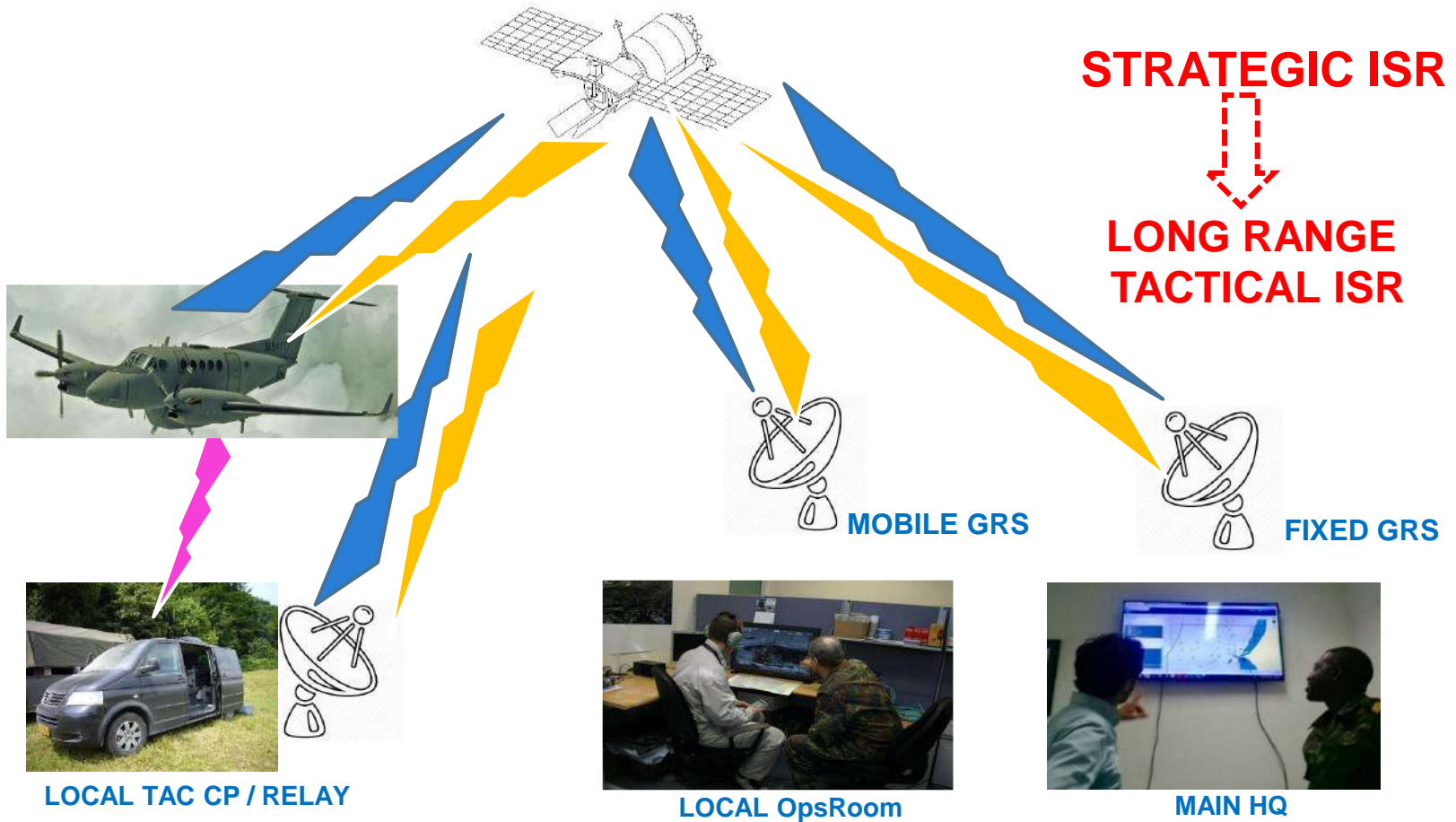
TRADITIONAL TACTICAL LEVEL 'EYE IN THE SKY'



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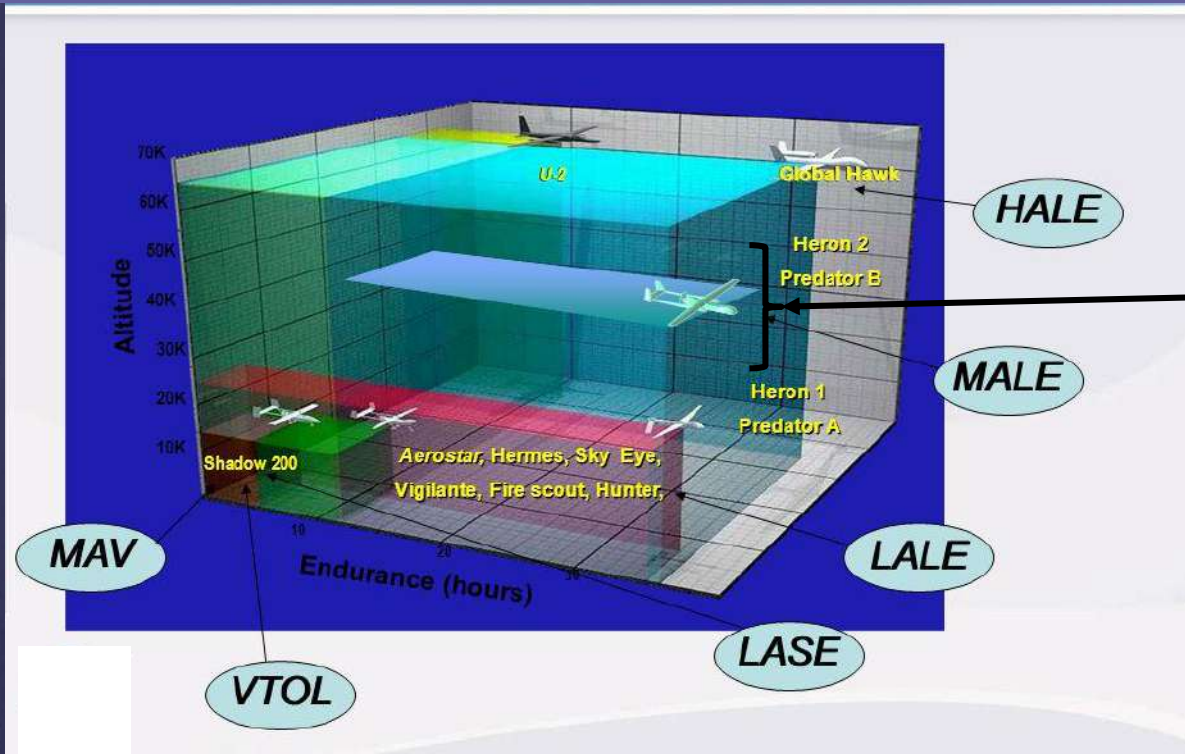
BEYOND LINE OF SIGHT UPLINK

STRATEGIC LEVEL 'EYE IN THE SKY'



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ISR OPERATIONAL ENVIRONMENT



Manned ISTAR Platform

- RPV NEED FOR SEGREGATED AIRSPACE
- RPV WEATHER & PAYLOAD LIMITATIONS
- RPV 'STRAW VIEW' EFFECT
- HIGH TO EXTREME NEED FOR BANDWIDTH
e.g. 2010 AFGHANISTAN 732 ea ISR ASSETS SIMULTANEOUSLY IN THE AIR

ISR = MORE AND MORE A BALANCED MIX OF MANNED & UNMANNED (RPV) ASSETS
Liberty – Shadow – ALSR Programs

OUR REQUIREMENTS

‘SECURE, RELIABLE AND ACCESSIBLE SATELLITE COMMUNICATIONS’

(NOT RANCKED IN ORDER OF IMPORTANCE...)

- **AS MUCH COVERAGE AS POSSIBLE (multiple aircraft / multiple locations)**
 - PERMANENT AVAILABILITY
 - RELATIVE LOW & INFREQUENT UTILISATION
- **AS MUCH BANDWIDTH AS POSSIBLE ALLOWING PERMANENT TWO WAY HIGH QUALITY VOICE & DATA STREAM**
- **SECURE & AS DISCRETE AS POSSIBLE**
- **AS LOW AS POSSIBLE GRAVIMETRIC FOOTPRINT OF THE EQUIPMENT**
- **AS CHEAP AS POSSIBLE**

OUR REQUIREMENTS

RELIABLE, HIGH CAPACITY SATCOM-ON-THE-MOVE



L-band



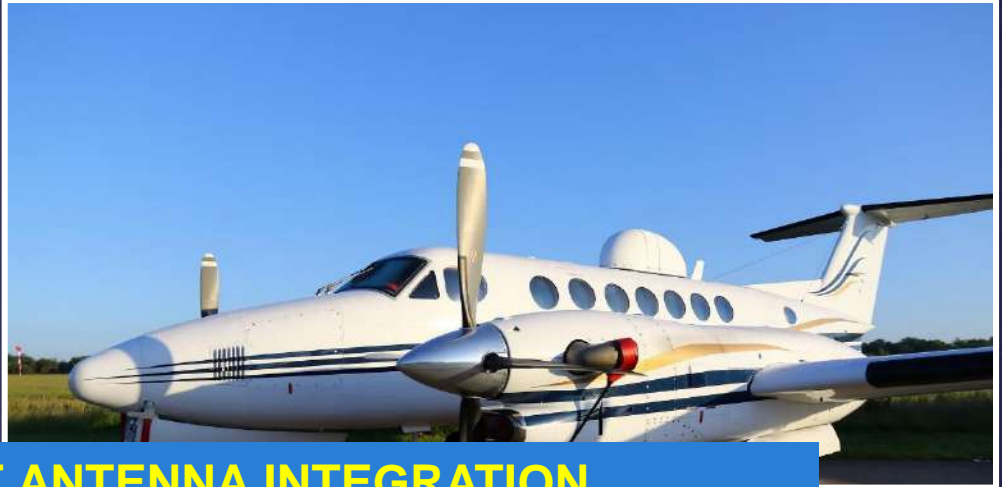
X-band
MilKa-band
(Lux)GovSat



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OUR ISSUES

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AIRCRAFT ANTENNA INTEGRATION
AIRFRAME SPACE – INTERFERENCE – CERTIFICATION – PERFORMANCE – COST



OUR ISSUES

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AIRCRAFT MODEM & PA INTEGRATION
SPACE – WEIGHT – COOLING - MTBF - COST



QUESTIONS ?

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**EUROPEAN LEADER
IN AIRBORNE GROUND SURVEILLANCE &
RECONNAISSANCE AND SPECIAL AIR WORK**



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