

# **European Global Aeronautical Distress and Safety System (GADSS) Webinar**

## **Airbus solutions and implementation of GADSS**

GADSS Webinar

Claude Pichavant, 9<sup>th</sup> December 2020

**AIRBUS**



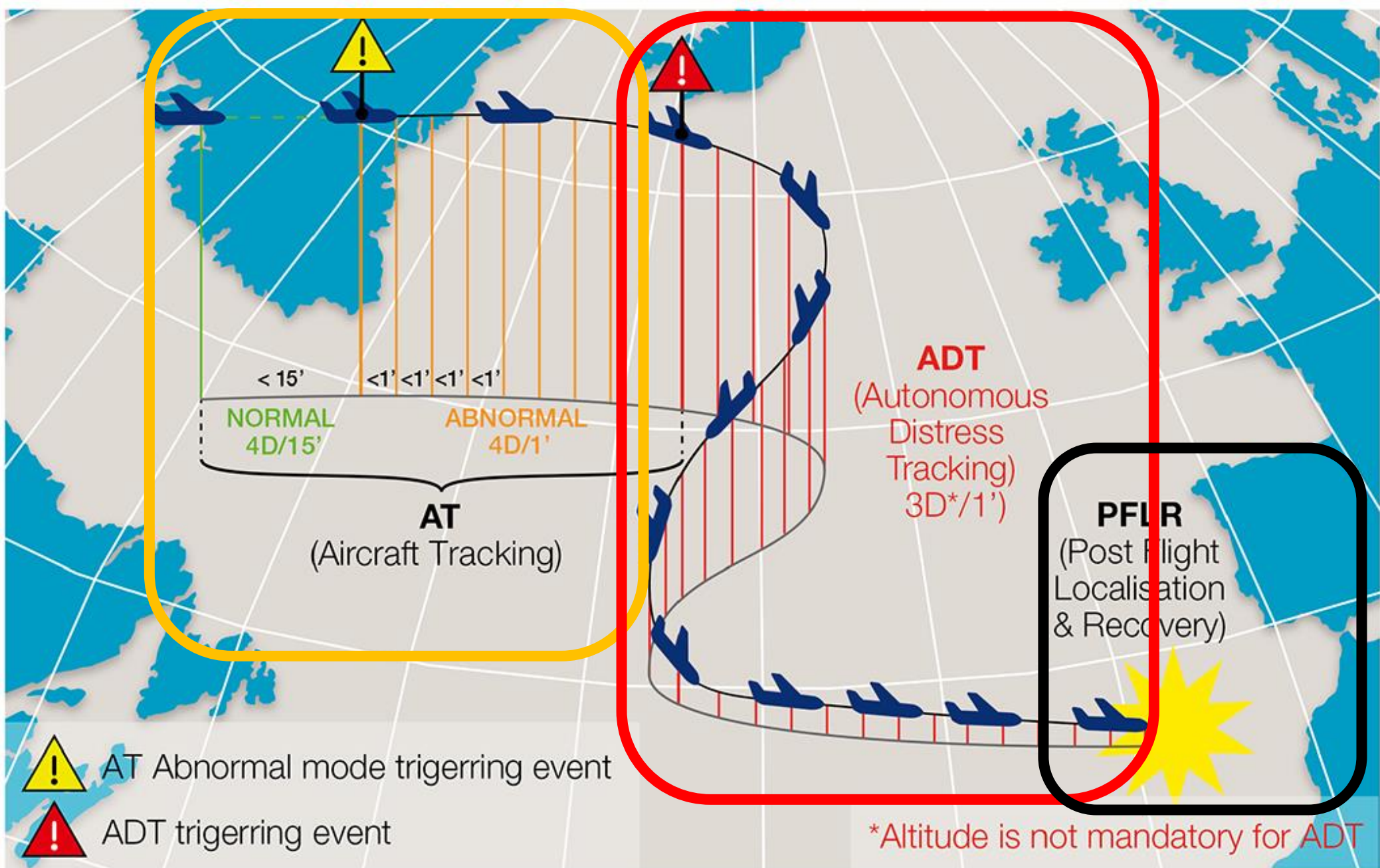
## GADSS Concept



## GADSS implementation on Airbus A/C - Update on:

- ADT
- PFLR









## Airline role

- Check relevant regulation with NAA
- Make sure that all concerned A/C are fitted with the right technologies
- Manage the Alerts generated by the tracking system
- Establish the procedures supporting GADSS

***Reminder:  
ADT is placed under Airlines /  
Operators responsibility***

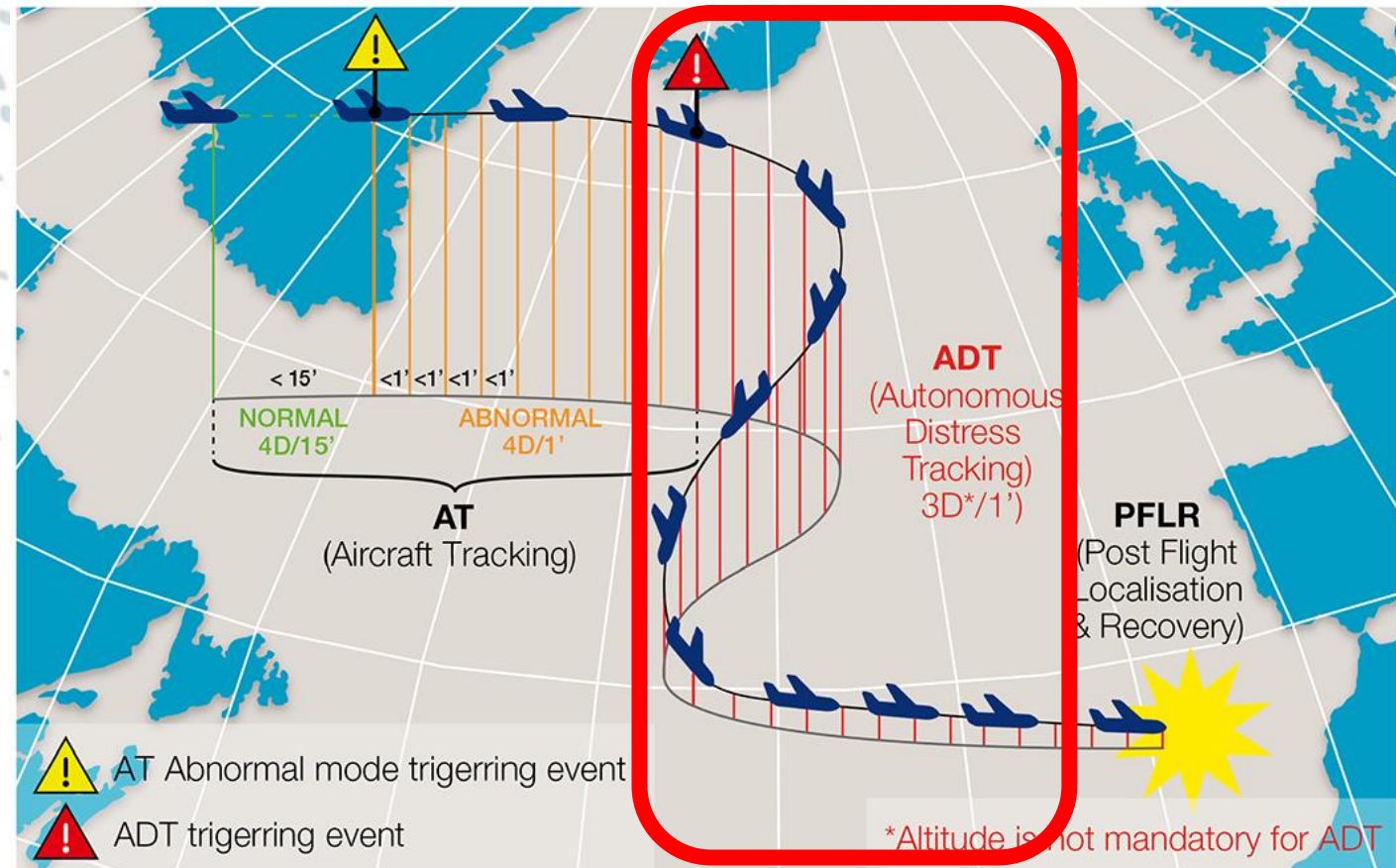


# ICAO

Refer to ICAO ANNEX 6.

Use for guidance the ICAO Doc 10054:  
Manual on Location of Aircraft in Distress and  
Flight Recorder Data Recovery.

# ADT -Autonomous Distress Tracking



# Autonomous Distress Tracking



ICAO

ICAO Annex 6 Amendment 44 Part I §6.18  
A/C having a Certificate of Airworthiness issued on and after 01/01/2023

ADT

CAT.GEN.MPA.210  
A/C having a Certificate of Airworthiness issued on and after 01/01/2023



# Autonomous Distress Tracking

Capability to detect a distress and transmit information allowing to determine the position of an aircraft at least once every minute:

- Provides 3D Position
- Activates within 5 seconds upon distress detection
- Gives accident site determination with a 6NM radius
- Uses protected distress spectrum
- Is resilient to faults of A/C power, communication and navigation
- Sends signal to Search and Rescue



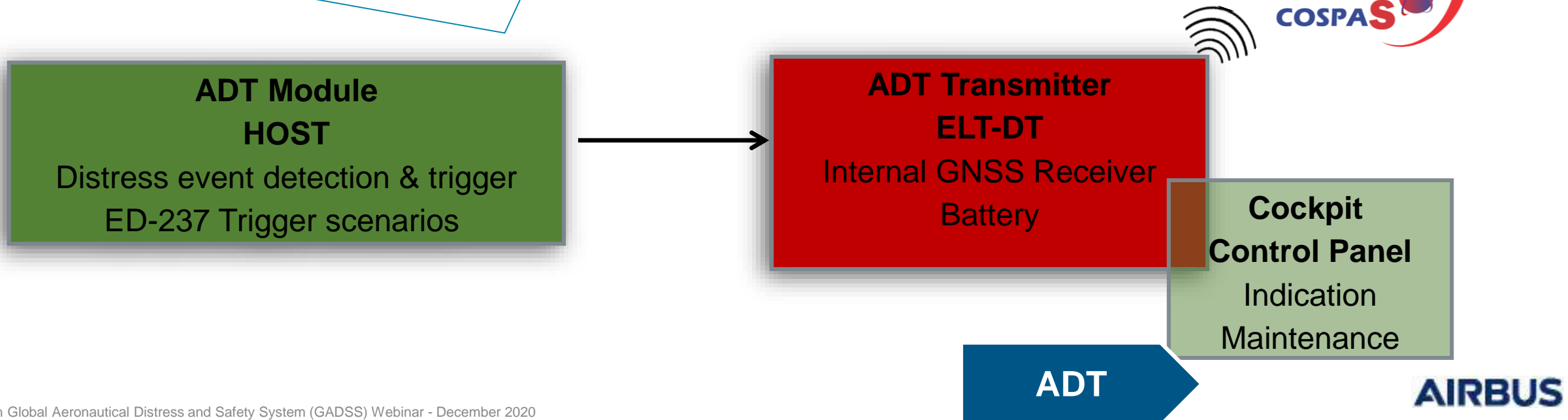
***Note: “Distress is a situation which, if left uncorrected, is likely to result in an accident”.***

ADT

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# Autonomous Distress Tracking

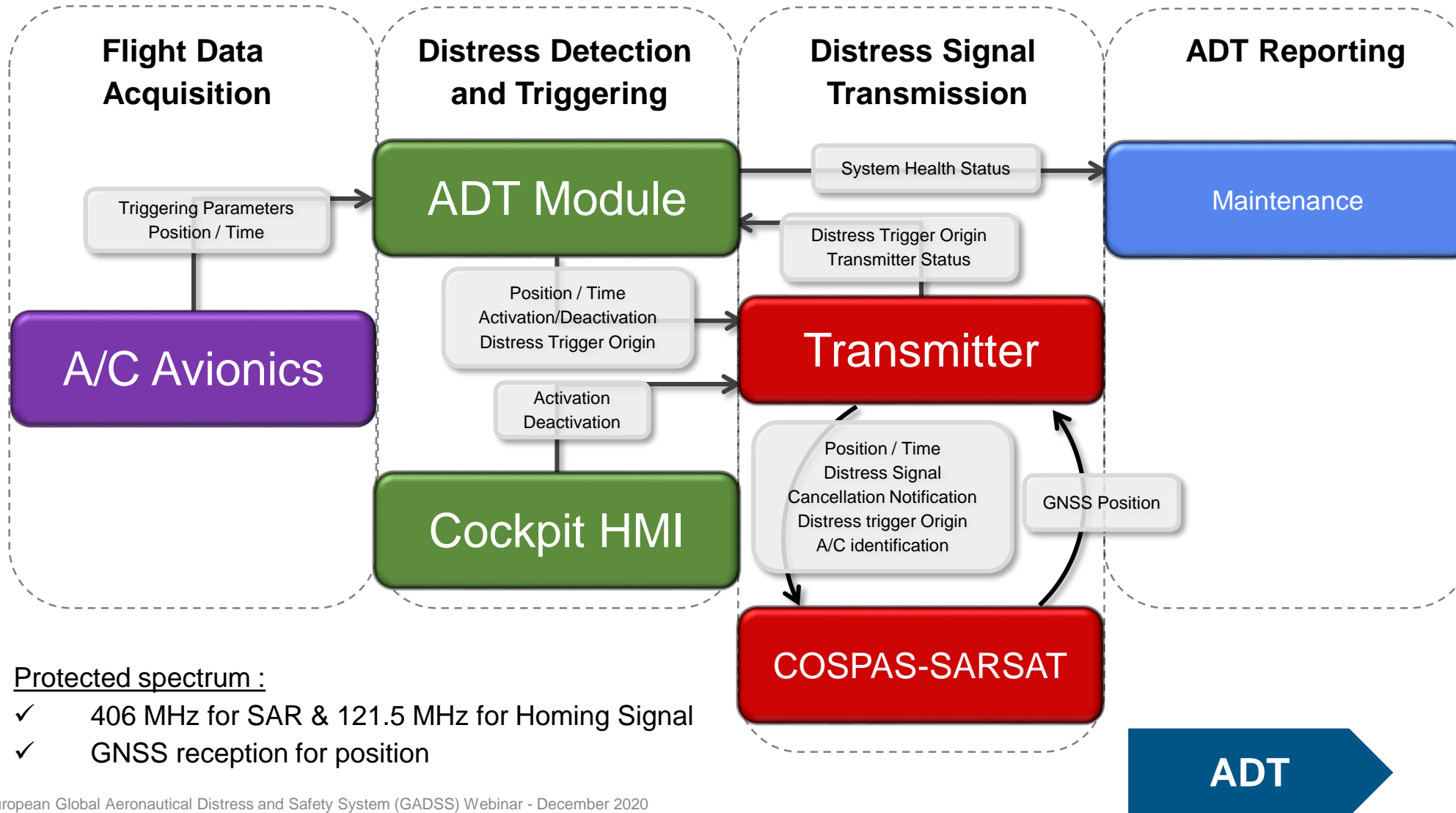
- ADT is described by ARINC Report 680, based on ICAO requirements and individual Civil Aviation Authorities (CAAs) initiatives.
- Airbus ADT solution is ELT-DT (Emergency Locator Transmitter-Distress Tracking) based;
  - ✓ To use well proven and secured (protected distress spectrum) Space and Ground segments and procedures of Cospas Sarsat, e.g. direct signal to SAR
  - ✓ To minimize the impact on our different aircraft types
    - Distress will only be able to be de-activated using the same mechanism that activated it
    - Standalone autonomously powered and crash survivable





# Autonomous Distress Tracking Principle

Nuisance alerts to SAR should not exceed more than 2 per 100 000 Flight Hours

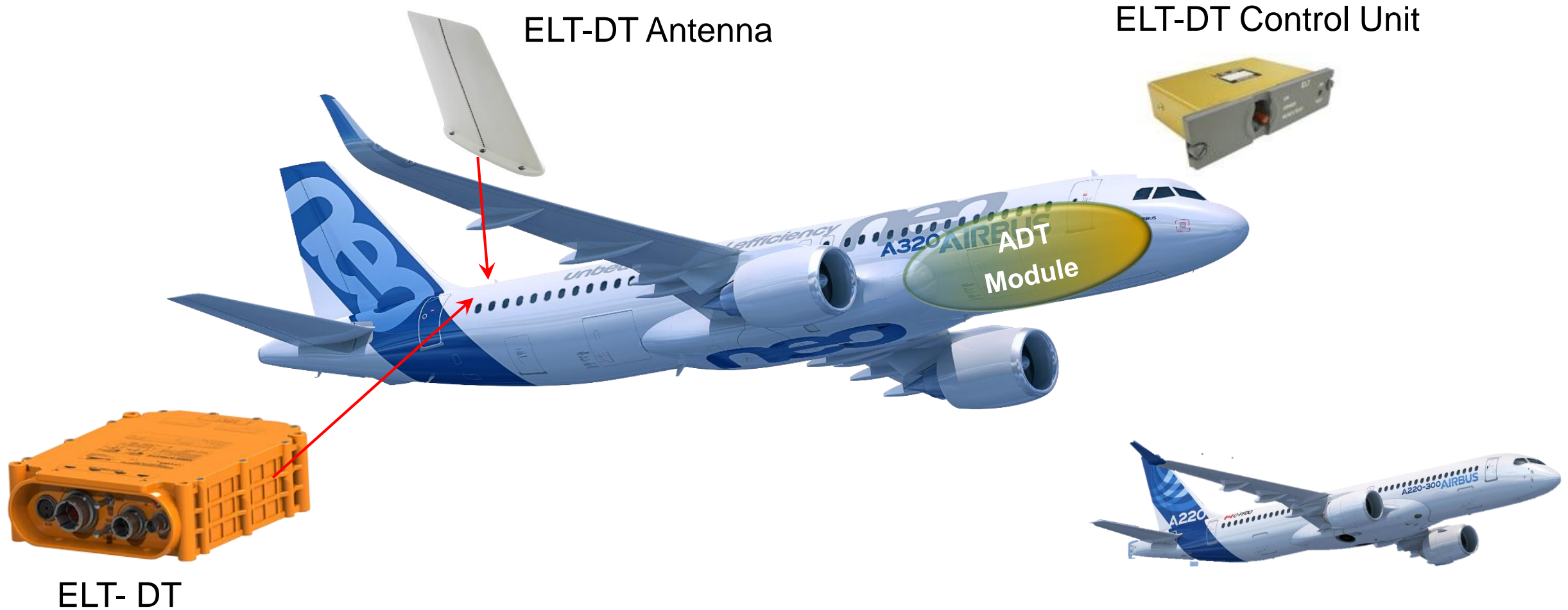


Protected spectrum :




- ✓ 406 MHz for SAR & 121.5 MHz for Homing Signal
- ✓ GNSS reception for position

# Autonomous Distress Tracking

Airbus solution - Equipment overview on A320 / A330 / A350 and A220 families

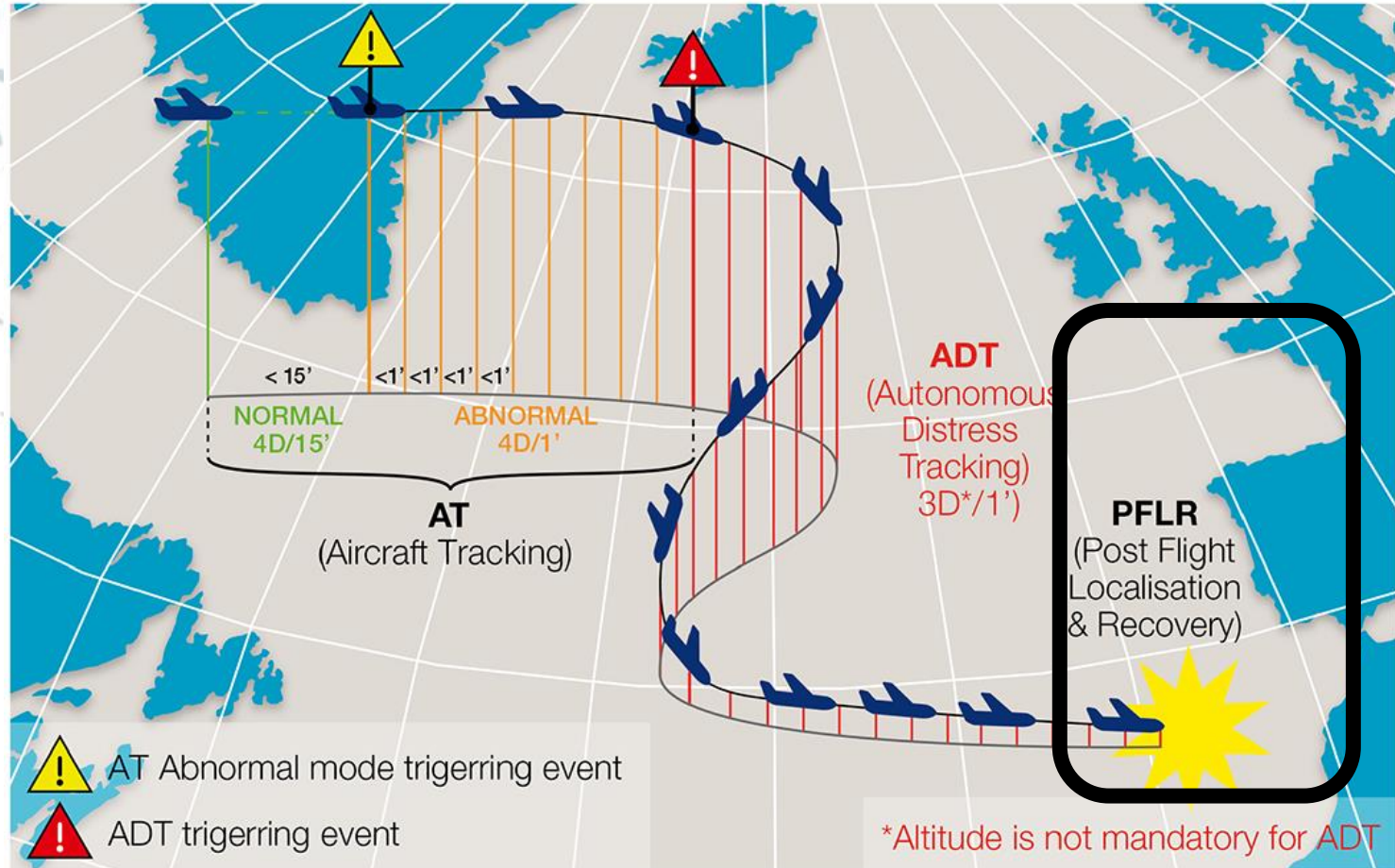


# ADT - Implementation on all Airbus programs

A/C Family	ADT 01/01/2023
<b>A320 &amp; A220</b> 	<b>Standalone ELT-DT &amp; ADT module (Hosting Function)</b>
<b>A321XLR</b> 	
<b>A330 &amp; A350</b> 	

**Note: Solution will be available for retrofit via Airbus Service Bulletin**

# PFLR Post Flight Localization & Recovery





# Post Flight Localization and Recovery



ICAO

ICAO Annex 6 Part I §6.3.6 :

Appendix 8 §4 : Automatic Deployable Flight Recorder

A/C with an application for New Type Certificate filed on or after 01/01/2021

**AIRBUS safety enhancement initiative**

**PFLR**

CAT.IDE.A.185 : Cockpit voice Recorder **with 25 Hrs capacity**

CAT.IDE.A.190 Flight Data Recorder

CAT.IDE.A.195 : Datalink recorder

CAT.IDE.A.200 : Dual recorders

CAT.IDE.A.280 : Automatic ELT

CAT.GEN.MPA.210 : Location of an A/C in Distress

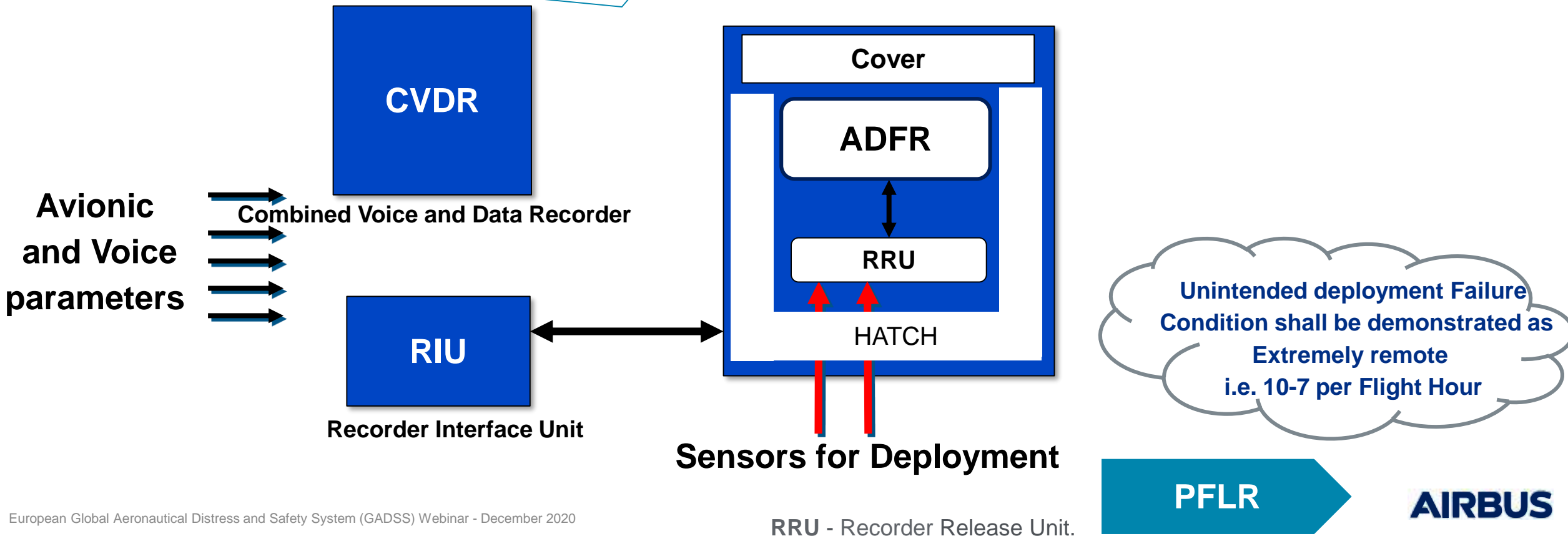
Regulations of FAA Part 91/121 (e.g. §121.344 §121.357 §91.207) are considered.



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# Post Flight Localization and Recovery

- PFLR is described by ARINC Report 681, based on ICAO requirements and individual Civil Aviation Authorities (CAAs) initiatives
- Suggested implementation options: Deployable Recorder, Data streaming
- ❖ Airbus PFLR solution is Automatic Deployable Flight Recorder (ADFR) based, this is an Airbus Safety initiative



# Post Flight Localization and Recovery

Airbus implementation is ADFR architecture on A350XWB, A330 Families and A321XLR, objective : forward-fit starting 2023

Automatic Deployable Flight Recorder



Recorder Interface Unit



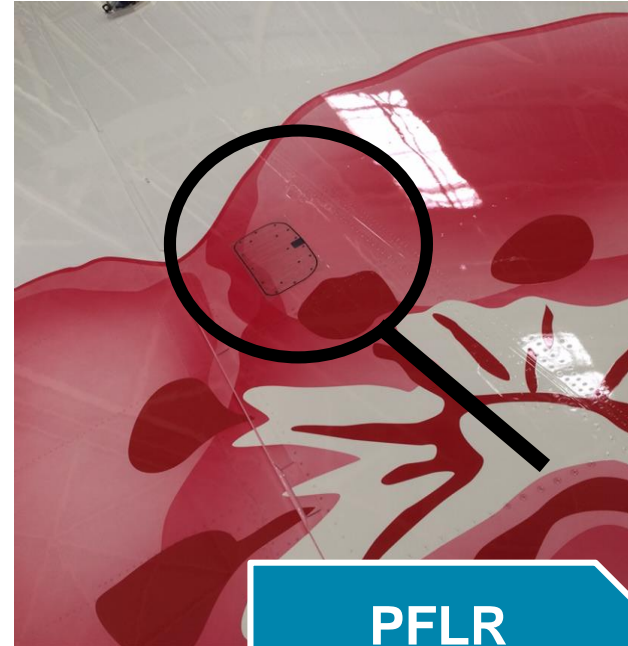
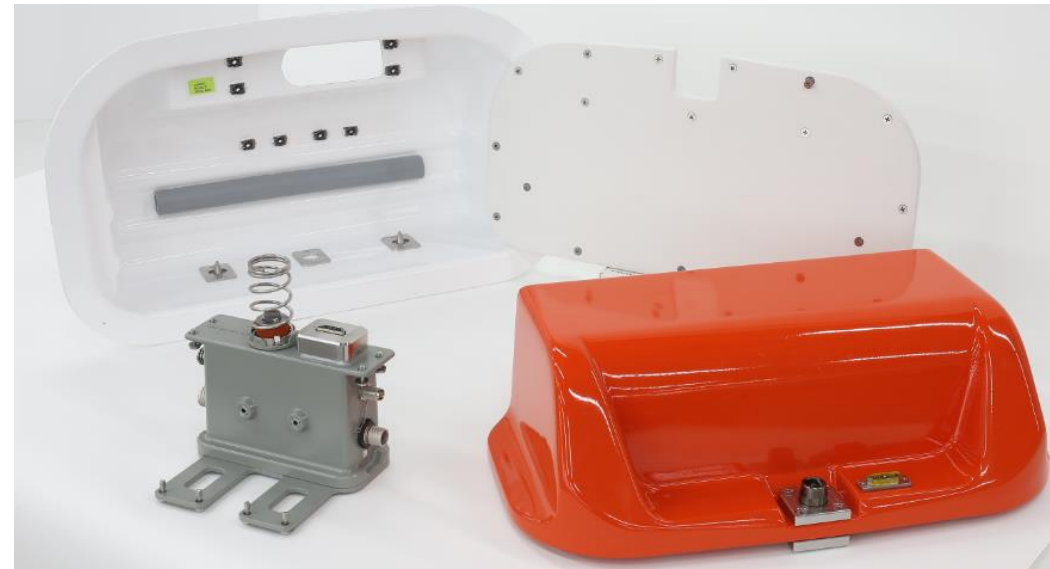
Combined Voice and Data Recorder



# Post Flight Localization and Recovery

## Automatic Deployable Flight Recorder (ADFR)

- Records cockpit voice, datalink and flight data
- Ejected during crash or immersion detection (sensors)
- [emits a 406 Mhz signal.](#)
- [emits a homing signal \(121.5 Mz\)](#)
- Capable of 25 hours of voice recording (provisions for FCMI)



PFLR





# Post Flight Localization and Recovery

## Cockpit Voice Data Recorder (CVDR)

- Records cockpit voice, datalink and flight data
- Equipped with 37.5kHz, 90-day Underwater Locator Beacon
- Capable of 25 hours of voice recording (provisions for FCMI)



## Recorder Interface Unit (RIU)

- Data concentrator for ADFR
- Allows ADFR read-out without un-mounting it



PFLR

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# Post Flight Localization and Recovery

Airbus implementation on A320 Family :

Dual CVDR Capable 25 HRS, objective : Forward-fit starting 2021

**ADFR architecture is proposed as an option**

Combined Voice and Data Recorder 2



Combined Voice and Data Recorder 1



# ADFR - Implementation on all Airbus programs.

<b>A/C Family</b>	<b>ADFR Target 01/01/2023</b>
<b>A320</b> 	<b>Option ADFR</b>
<b>A321XLR</b> 	<b>ADFR</b>
<b>A330 &amp; A350</b> 	

# Other devices installed basically on all Airbus A/C

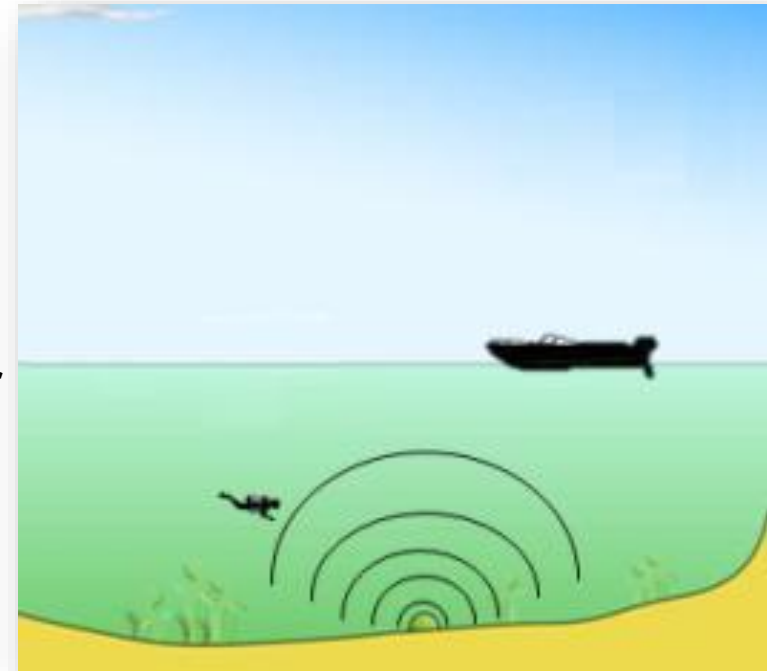


**90 days ULB- Low Frequency  
attached to primary structure  
(8,8Khz - 12NM)**

**In addition to floating ADFR**






**90 days ULB  
attached to recorder  
(37,5Khz - 2,5NM)**



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# Implementation on all Airbus programs.

A/C Family	ADT 01/01/2023	ADFR Target 01/01/2023
<b>A320 &amp; A220</b> 	<b>Standalone ELT-DT</b>	<b>Option ADFR</b> (Except A220)
<b>A321XLR</b> 		<b>ADFR</b>
<b>A330 &amp; A350</b> 		

# Conclusion

- Full, compliant, implementation of A/C Systems enabling ICAO ADT and PFLR GADSS components on board.
- Compliance with various Regulations, including CVR 25 Hours and ULBs.

## Benefits

- Compact solutions
- Robust solution based on existing COSPAS-SARSAT satellite payloads.
- Combined and Deployable recorders for an improved dispatch reliability.
- Fleet commonality
- Tracking and Recorders are fully part of Safety continuous improvement

**Any questions ?**



## Table of Acronyms

A/C	Aircraft
ADFR	Automatic Deployable Flight Recorder
ADT	Autonomous Distress Tracking
ARINC	Aeronautical Radio Incorporated
AT	Aircraft Tracking
NAA	Civil Aviation Authority
CVR	Cockpit Voice Recorder
CVDR	Combined Voice and Data Recorder
DFDR	Digital Flight Data Recorder
EASA	European Aviation Safety Agency
ELT-DT	Emergency Locator Transmitter – Distress Tracking
FAA	Federal Aviation Administration
GADSS	Global Aeronautical Distress Safety System
GAT	Global Aircraft Tracking
GNSS	Global Navigation Satellite System
ICAO	International Civil Aviation Organization
NAA	National Airworthiness Authority
NM	Nautical Mile

## Table of Acronyms

OCC	Operations Control Centre
PFLR	Post Flight Localization and Recovery
RCC	Rescue Coordination Center
RIU	Recorder Interface Unit
RRU	Recorder Release Unit
SAR	Search And Rescue
SARP	Standards and Recommended Practices
ULB	Underwater Locator Beacon
VTP	Vertical Tail Plane
3D	Three Dimensions



Thank you