
ICAO
INTERNATIONAL
CIVIL AVIATION
ORGANIZATION
A UN SPECIALIZED AGENCY
RECONNECTINGTHEWORLD

Global Aeronautical Distress and Safety System (GADSS) Provisions

Elkhan Nahmadov
Deputy Regional Director, ICAO EUR-NAT

3 October 2024

Global Aeronautical Distress and Safety System (GADSS)

1 A Brief History of GADSS

2 Aircraft Tracking

3 Location of an Aircraft in Distress

4 Post Flight Localization

ICAO

1

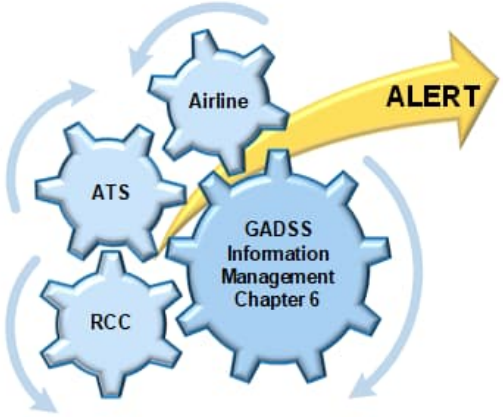
A Brief History of GADSS

Global Aeronautical Distress and Safety System

Aircraft Tracking

Location of Aircraft in Distress

Post Flight Localization



SAR

Flight Recorder Data Recovery

Accident Investigation

Why GADSS?

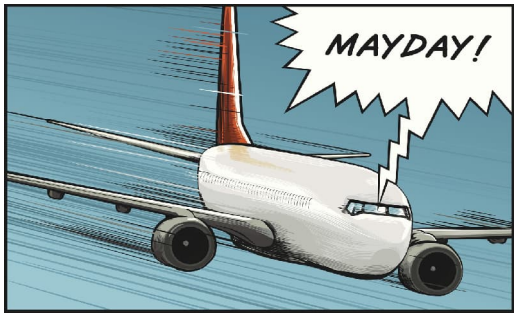
Air France flight AF447, 1 June 2009

Malaysian Airlines flight MH370, 8 March 2014

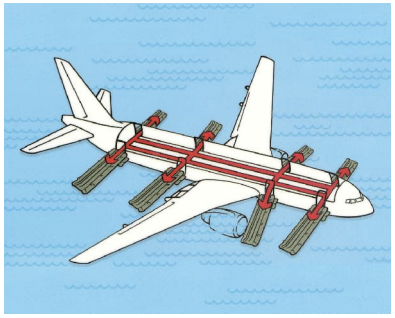
ICAO

GADSS main functions

Aircraft Tracking



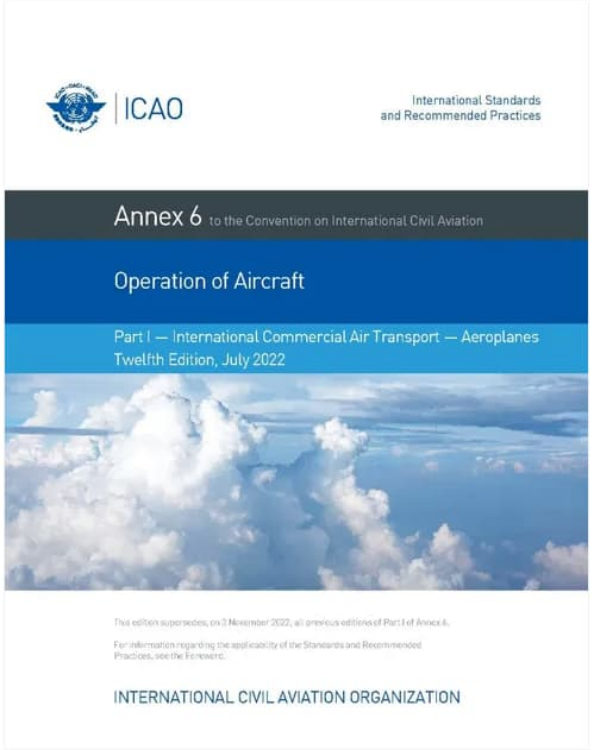
Location of Aircraft in Distress

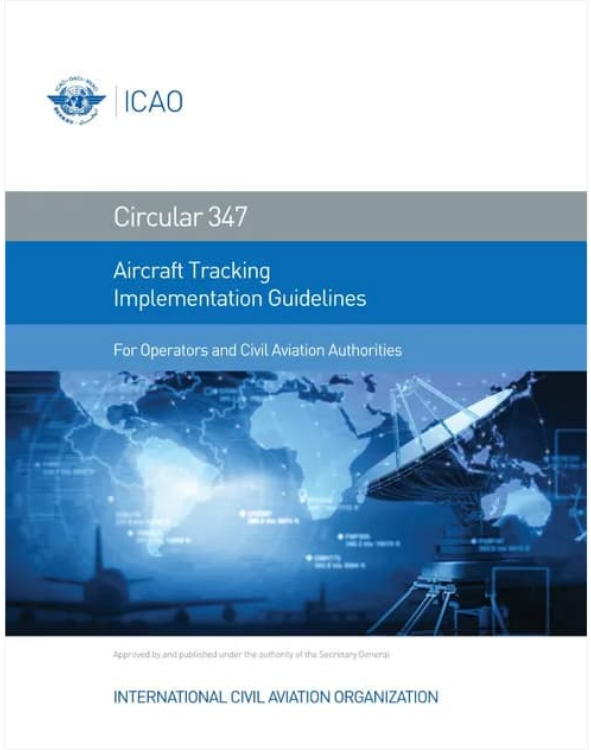


Post Flight Localization

2

Aircraft Tracking





ICAO

Annex 6 — *Operation of Aircraft*, Part I — *International Commercial Air Transport — Aeroplanes*

3.5 AIRCRAFT TRACKING

3.5.1 The operator shall establish an aircraft tracking capability to track aeroplanes throughout its area of operations.

Note.— Guidance on aircraft tracking capabilities is contained in the Aircraft Tracking Implementation Guidelines (Cir 347).

3.5.2 **Recommendation**.— *The operator should track the position of an aeroplane through automated reporting at least every 15 minutes for the portion(s) of the in-flight operation(s) under the following conditions:*

a) the aeroplane has a maximum certificated take-off mass of over 27 000 kg and a seating capacity greater than 19; and

b) where an ATS unit obtains aeroplane position information at greater than 15 minute intervals.

Note.— See Annex 11, Chapter 2, for coordination between the operator and air traffic services providers regarding position report messages.

3.5.3 The operator shall track the position of an aeroplane through automated reporting at least every 15 minutes for the portion(s) of the in-flight operation(s) that is planned in an oceanic area(s) under the following conditions:

a) the aeroplane has a maximum certificated take-off mass of over 45 500 kg and a seating capacity greater than 19; and

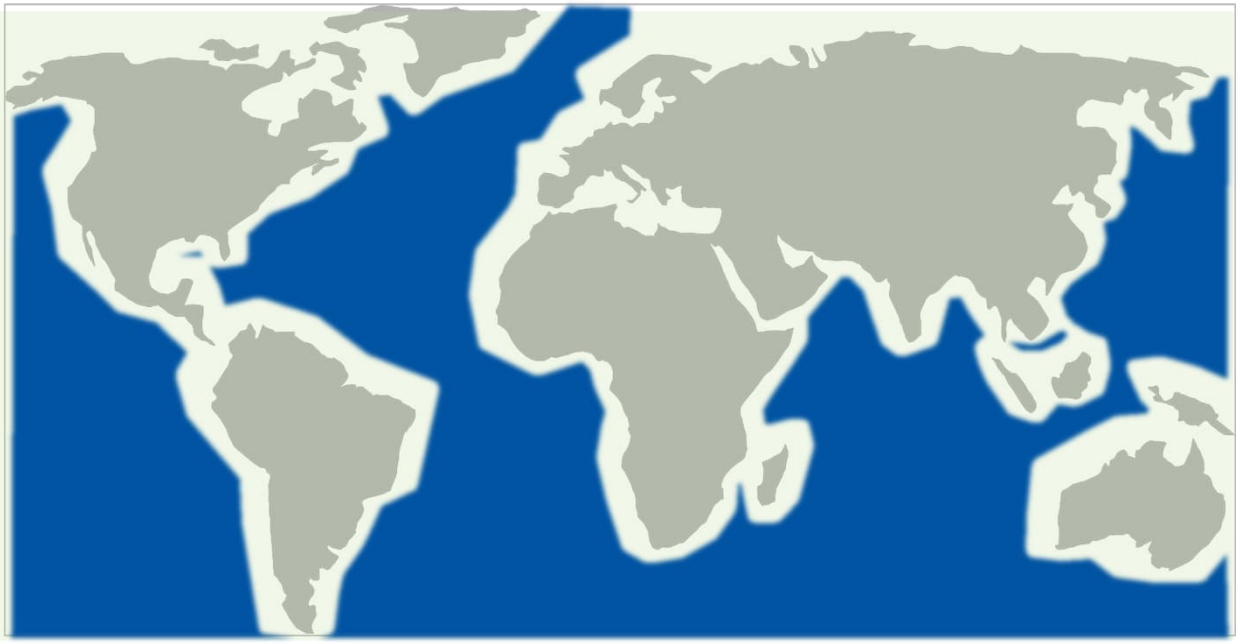
b) where an ATS unit obtains aeroplane position information at greater than 15 minute intervals.

Note 1.— Oceanic area, for the purpose of aircraft tracking, is the airspace which overlies waters outside the territory of a State.

Annex 6 — *Operation of Aircraft*, Part I — *International Commercial Air Transport — Aeroplanes*

3.5 AIRCRAFT TRACKING

When the ATS reporting interval is greater than 15 min



Requirement to track

Recommendation
Operators to track at 15 minute intervals

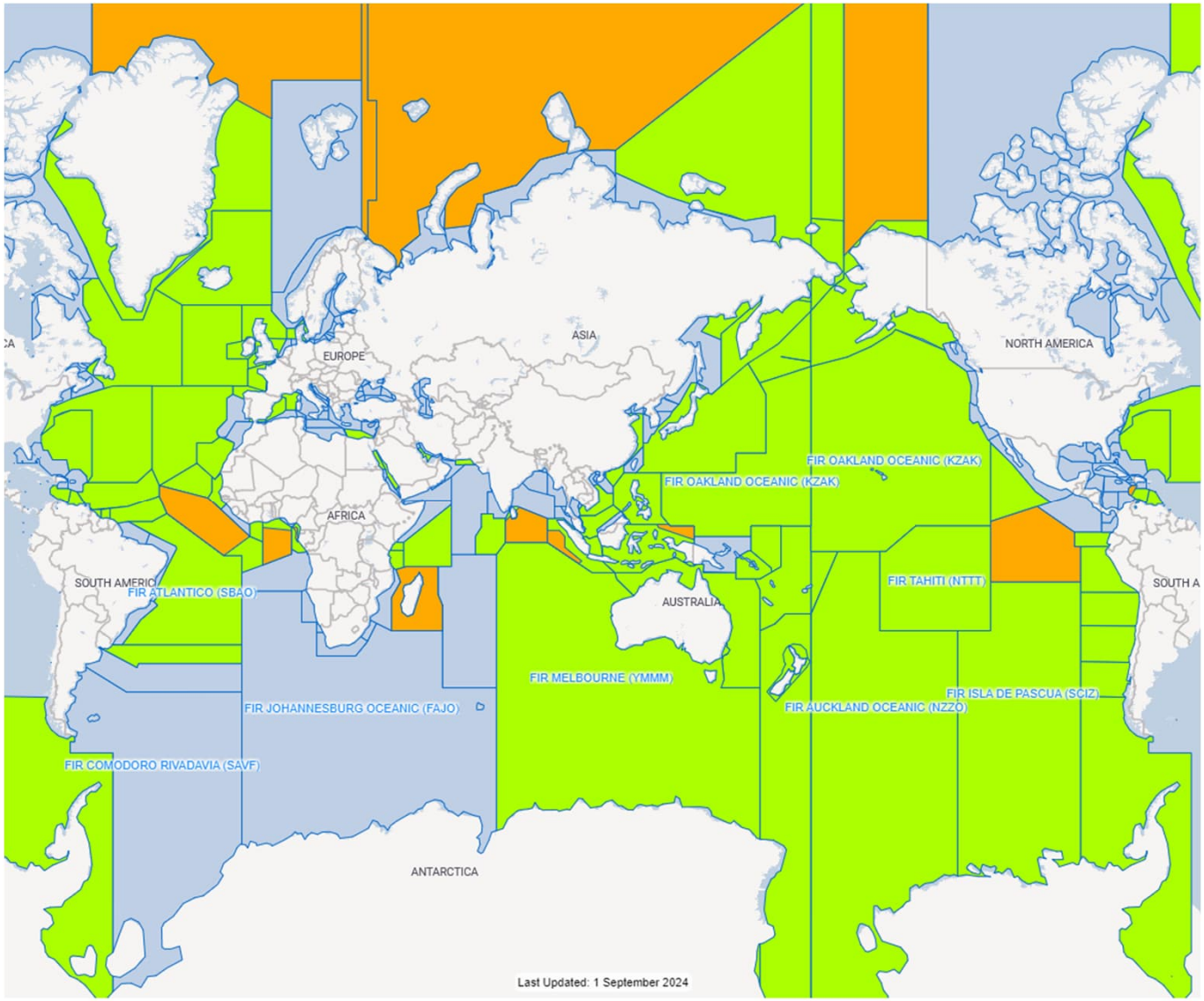
Requirement
Operators to track at 15 minute intervals

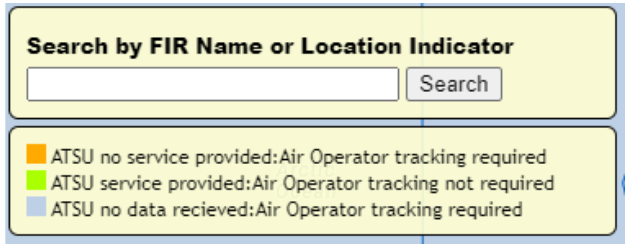
Became Applicable 8 Nov 2018

Seating capacity greater than 19 Seats

27,000 Kg (Should)

45,500 Kg (Shall)





https://www4.icao.int/opsctrl/

aircrafttracking@icao.int

ICAO

Aircraft Tracking

How?

Automated position reporting.

Position reports are four-dimensional (latitude, longitude, altitude and time).

Reduced time interval in resolving the status of, or locating, an aircraft.

- Assists in timely identification and location of aircraft
- Reduces the reliance on procedural methods used to determine aircraft position
- Helps to ensure the availability and sharing of aircraft position data
- Helps to improve the effectiveness, efficiency and performance of ATS unit alerting

And from a SAR perspective, this matters because…

- Aircraft Tracking means operators know the location of their aircraft.
- This helps with Uncertainty Phase.

3

Location of an Aircraft in Distress

Annex 6 — *Operation of Aircraft*, Part I — *International Commercial Air Transport — Aeroplanes*

6.18 LOCATION OF AN AEROPLANE IN DISTRESS

6.18.1 As of 1 January 2025, all aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2024, shall autonomously transmit information from which a position can be determined by the operator, at least once every minute, when in distress, in accordance with Appendix 9.

6.18.2 **Recommendation.—** *All aeroplanes of a maximum certificated take-off mass of over 5 700 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2023, should autonomously transmit information from which a position can be determined at least once every minute, when in distress, in accordance with Appendix 9.*

6.18.3 The operator shall make position information of a flight in distress available to the appropriate organizations, as established by the State of the Operator.

6.18.1 As of 1 January 2025, all aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2024, shall autonomously transmit information from which a position can be determined by the operator, at least once every minute, when in distress, in accordance with Appendix 9.

6.18.1 As of 1 January 2025, all aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2024, shall autonomously transmit information from which a position can be determined by the operator, at least once every minute, when in distress, in accordance with Appendix 9.

Big planes

6.18.1 As of 1 January 2025, all aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2024, shall autonomously transmit information from which a position can be determined by the operator, at least once every minute, when in distress, in accordance with Appendix 9.

That are new this year

6.18.1 As of 1 January 2025, all aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2024, shall autonomously transmit information from which a position can be determined by the operator, at least once every minute, when in distress, in accordance with Appendix 9.

Will do something
from 1 January 2025.

6.18.1 As of 1 January 2025, all aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2024, shall autonomously transmit information from which a position can be determined by the operator, at least once every minute, when in distress, in accordance with Appendix 9.

Big planes

That are new next year

Will do something from 1 January 2025.

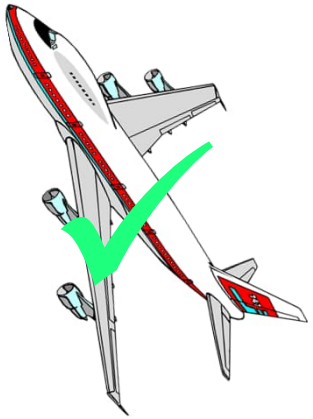
6.18.1 As of 1 January 2025, all aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2024, shall autonomously transmit information from which a position can be determined by the operator, at least once every minute, when in distress, in accordance with Appendix 9.

Information, not positions

6.18.1 As of 1 January 2025, all aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2024, shall autonomously transmit information from which a position can be determined by the operator, at least once every minute, when in distress, in accordance with Appendix 9.

Reality is more often

6.18.1 As of 1 January 2025, all aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2024, shall autonomously transmit information from which a position can be determined by the operator, at least once every minute, when in distress, in accordance with Appendix 9.

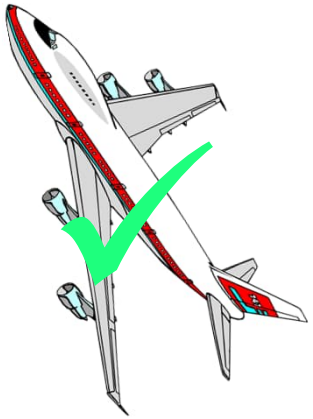


Unusual

6.18.1 As of 1 January 2025, all aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2024, shall autonomously transmit information from which a position can be determined by the operator, at least once every minute, when in distress, in accordance with Appendix 9.

Information, not positions

Reality is more often



Unusual


DISTRESS TRACKING
→ Automatic
→ Manual
AUTONOMOUS
6 NM
Aircraft behavior event that if left uncorrected, can result in an accident.
RESCUE COORDINATION CENTER

What's it for?

Annex 6 — *Operation of Aircraft*, Part I — *International Commercial Air Transport — Aeroplanes*

6.18.3 The operator shall make position information of a flight in distress available to the appropriate organizations, as established by the State of the Operator.

How to distribute the information?

Location of an Aircraft in Distress Repository (LADR) – What is it?!

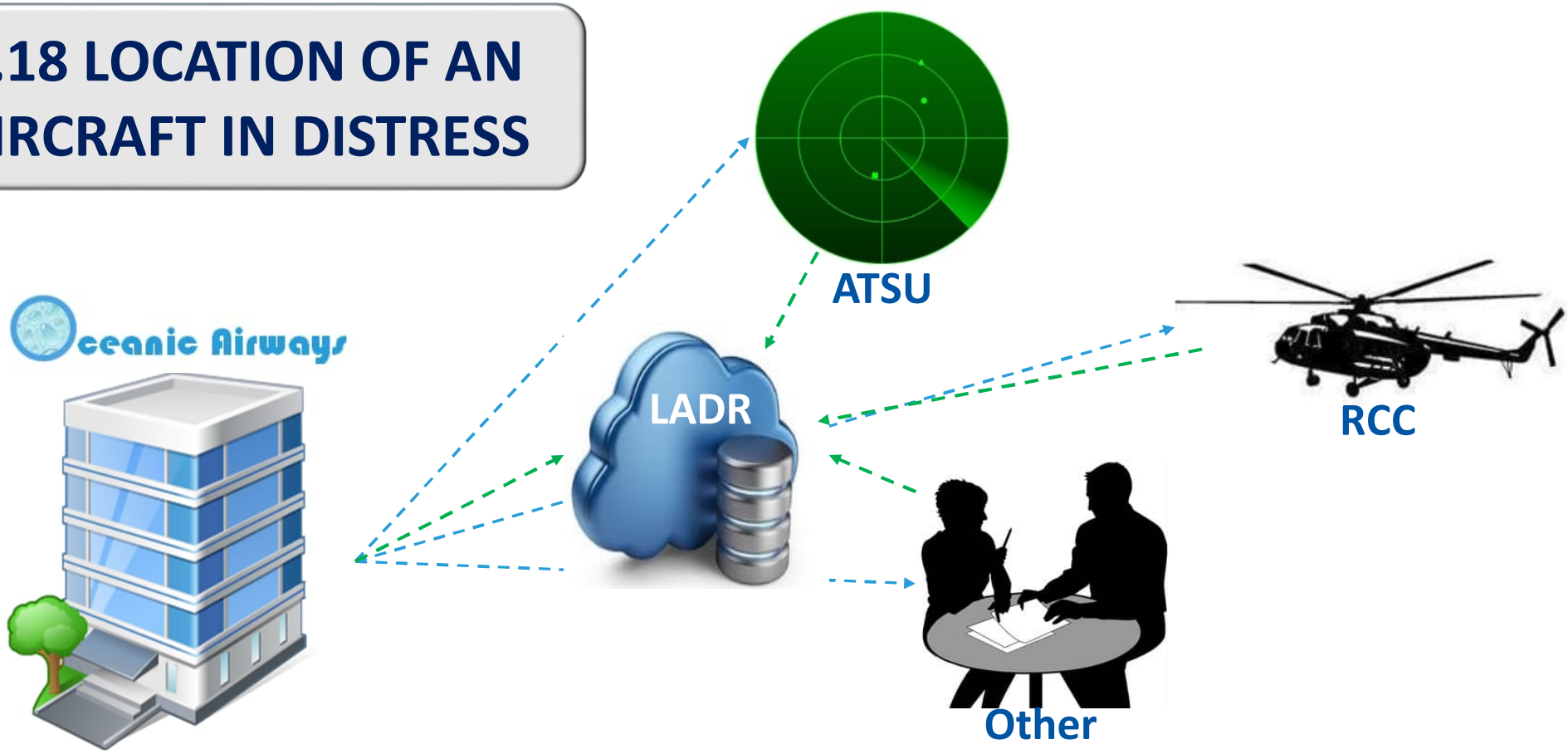
6.18 LOCATION OF AN AIRCRAFT IN DISTRESS

ATSU

RCC

Other

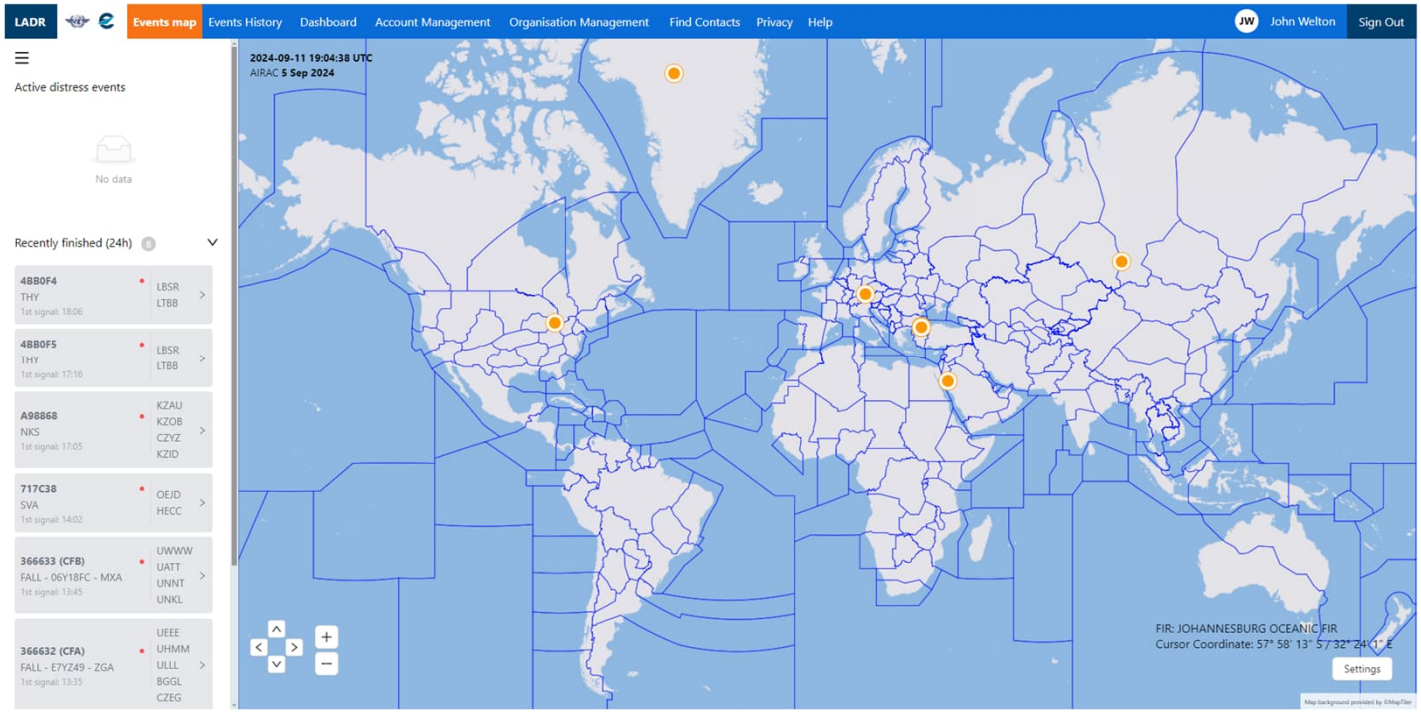
6.18 LOCATION OF AN AIRCRAFT IN DISTRESS



Fri 27/10/2023 09:24
From: LADR@EUROCONTROL.INT
To: operations.supervisors.group@State.area.control.centre
Subject: New information has been received by the LADR

New information has been received by the LADR which matches your user profile. Please take appropriate action.

- Start of distress triggers autonomous transmissions.
- LADR generates notification email



- The LADR can be accessed as data files, or using the viewer shown here.
- As a single source, there is reduced risk of transcription errors in passing position information and updates via voice.
- The LADR helps operators fulfil their responsibility under Annex 6, 6.18.3, to “make position information of a flight in distress available to the appropriate organizations”.

ICAO

OPS Control Directory

- Contact data for operators, ANSPs and rescue coordination centres
- Requirement applicable for ACCs and RCCs 28 November 2024 – Amendment 19 to Annex 12

Aircrafttracking@icao.int

ICAO

Applicability 28 November 2024

2.3 Rescue coordination centres and rescue subcentres

. . .

2.3.6 Each rescue coordination centre and, as appropriate, rescue subcentre shall maintain up-to-date contact details in the OPS Control Directory.

2.3.7 Each rescue coordination centre and, as appropriate, rescue subcentre shall subscribe and maintain access to the location of an aircraft in distress repository (LADR).

Note.— Guidance on the use of the OPS Control Directory and the LADR is contained in the Manual on Global Aeronautical Distress and Safety System (GADSS) (Doc 10165).

Applicability 26 November 2026

Editorial tidy-ups

Information regarding communications with vessels

Calls out RCCs and RSCs for inclusion in exercises, and to exercise away from aerodromes

Training of SAR personnel in health risks they may encounter at accident sites

Change from ‘accident site’ to ‘distress scene’

Applicability 26 November 2026

Clarification of responsibilities of SPOCs

3.2.5 Until 25 November 2026, States shall designate a search and rescue point of contact for the receipt of Cospas-Sarsat distress data.

3.2.5 As of 26 November 2026, States shall designate a 24-hour search and rescue point of contact available for the receipt and acknowledgement of Cospas-Sarsat distress alert data that ensures timely notification to the responsible RCC for the initiation of appropriate search and rescue response action.

Applicability 26 November 2026

Drift measurement

2.6.9 **Recommendation**.— *As of 26 November 2026, each search and rescue aircraft, when used for search and rescue over maritime areas, should carry a droppable device for measuring actual surface drift*

. . .

5.6.6 **Recommendation**.— *As of 26 November 2026, when carrying a device for measuring actual surface drift in accordance with 2.6.9, a search and rescue aircraft should drop the device as soon as it reaches the scene of an accident.*

Note.— The deployment of such devices will assist with search area planning accuracy and, therefore, minimize search times.

Applicability 26 November 2026

Position, course and speed of aircraft

4.1.2 **Recommendation**.— *Each rescue coordination centre should have readily available all other information of interest to search and rescue, including information regarding:*

. . .

e) as of 26 November 2026, the position, course and speed of aircraft that may be able to provide assistance to aircraft in distress; and

f) as of 26 November 2026, where the search and rescue region includes maritime areas, the position, course and speed of ships that may be able to provide assistance to aircraft in distress.

4.1.3 **Recommendation**.— *Until 25 November 2026, each rescue coordination centre whose search and rescue region includes maritime areas should have ready access to information regarding the position, course and speed of ships within such areas that may be able to provide assistance to aircraft in distress and information on how to contact them.*

Note.— This information may either be kept in the rescue coordination centres or be readily accessible.

Applicability 26 November 2026

Assistance from other States

4.2.4 The search and rescue plans of operation shall contain details regarding actions to be taken by those persons engaged in search and rescue, including:

. . .

i) as of 26 November 2026, the methods for obtaining approval to allow search and rescue units from an assisting State to enter into the territory of the State of the RCC;

Applicability 26 November 2026

Procedures for a pilot intercepting a distress transmission

5.7.2 Whenever a pilot monitors 121.5 MHz, and intercepts a transmission from a distress beacon, the pilot shall also:

a) record, and report as soon as possible, the position where the transmission was first received;

b) not alter any settings for squelch on the aircraft's radio; and

c) if feasible, continue to monitor the frequency until such time as the signal ceases, and inform the appropriate rescue coordination centre or air traffic services unit of such.

Note.— Retaining the existing settings for squelch from the time the transmission is first received until the signal ceases provides rescue coordination centres with the most accurate potential location of the distress beacon.

4

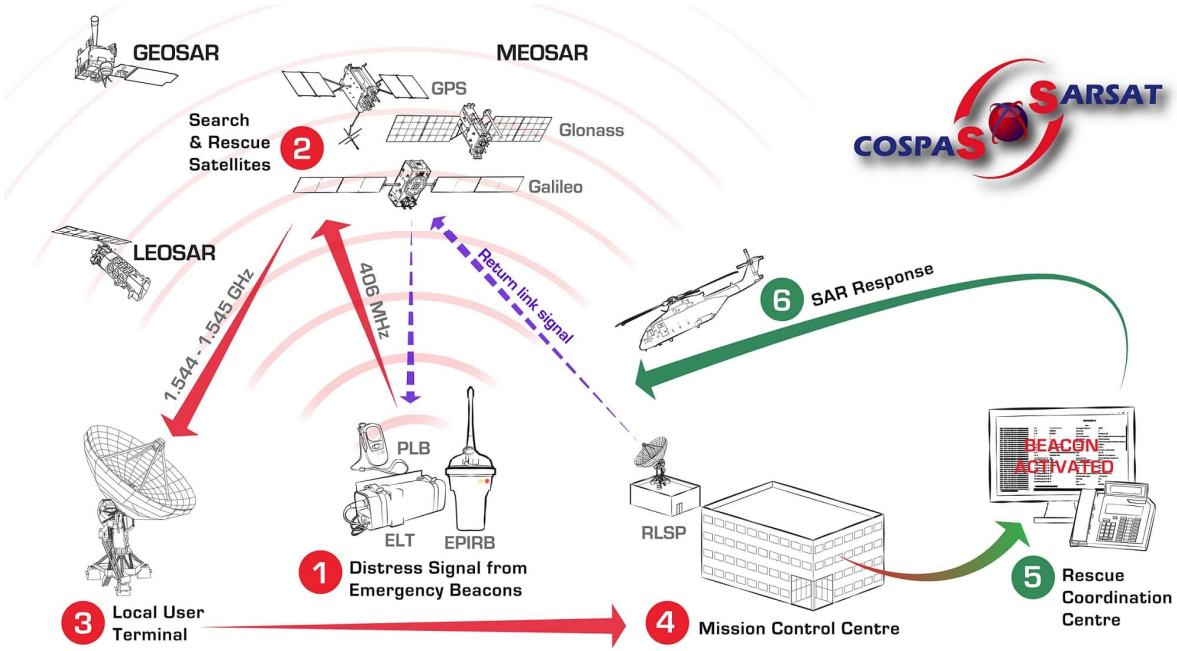
Post Flight Localization

Post Flight Localization

Emergency Locator Transmitter

Underwater Locating Devices

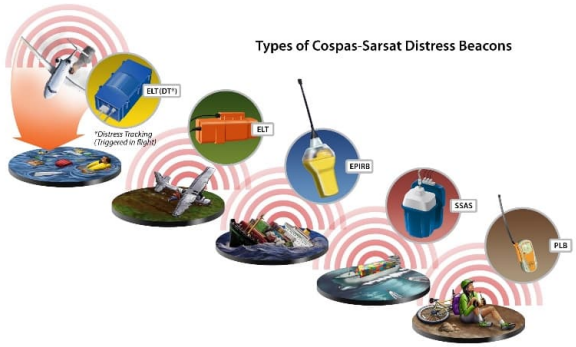
Flight Recorder Data Recovery



Images courtesy of Cospas-Sarsat

Emergency Locator Transmitters (ELTs)

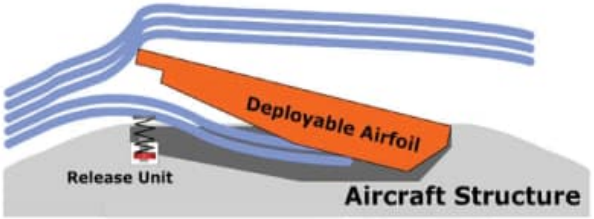
- One of a range of beacon types in the Cospas-Sarsat system
- Automatically or manually activated
- Multiple types – fixed to the airframe or portable
- Transmits distress alerts via satellite on 406 MHz
- Position homed to using a signal on 121.5 MHz
- Operates for 48 hours
- Recent improvements to survivability requirements



ICAO

Underwater locating devices

- Securely attached to the airframe
- Transmit homing signal on 8.8 KHz for 30 days (37.5 KHz for 90 days if attached to a flight recorder)
- Automatically activated
- Allows location of wreckage below the water surface



Flight Recorder Data Recovery

- Flight data assists with determining probable cause of accidents
- Recovered data to be made available in a timely manner
- Continuous transmission of flight recorder data
- Triggered transmission of flight recorder data
- Automatic deployable flight recorders (ADFR)

Publications relevant to GADSS

Annex 6 — *Operation of Aircraft*, Part I — *International Commercial Air Transport — Aeroplanes*

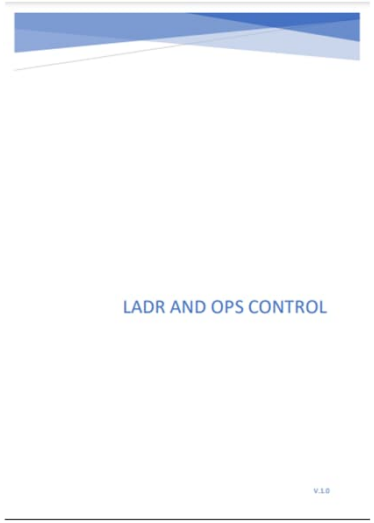
Annex 11 — *Air Traffic Services*

Annex 12 — *Search and Rescue*

PANS-OPS, Volume III — *Aircraft Operating Procedures* (Doc 8168)

The International Aeronautical and Maritime Search and Rescue Manual, Volume I and II (Doc 9731)

The Global Aeronautical Distress and Safety System (GADSS) Manual (Doc 10165)



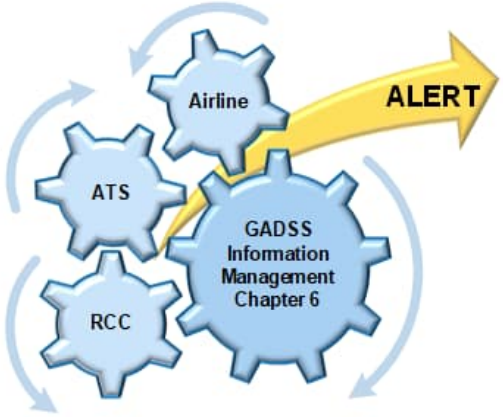
GADSS

Global Aeronautical Distress and Safety System

Aircraft Tracking

Location of Aircraft in Distress

Post Flight Localization



SAR

Flight Recorder
Data Recovery

Accident
Investigation

Thank You

ICAO