



GADSS AND ELT(DT)s

Arnaud Sindou

Cospas-Sarsat
Secretariat



ICAO APSAR WORKSHOP 2026
(Bangkok – 5 May 2026)

The GADSS Concept



ELT(DT) for Distress Tracking



- Unusual Yaw, Pitch, Bank
- Overspeed, low speed, stall
- Unusual altitude
- Ground proximity
- Loss of all engines
- Loss of electric power / disconnection

Other possible triggers: fire on board, high cabin altitude (depressurization)

Scenario #1:

ELT(DT) activates independently upon autonomous detection in-flight aircraft emergency signaling the distress to Cospas-Sarsat satellites (MEOSAR system).

ELT(DT) Design

- ICAO: “ADT is performance based and non-technology specific”



However,

Airbus, Boeing, Bombardier, Embraer,... airframers have selected the ELT(DT) as their ADT system to satisfy:

- ICAO Annex 6 - GADSS recommendations
 - European operational requirements (see ED-237)
- and share the positions of their aircraft if in distress

ELT(DT) Design

- Linked to aircraft avionics for autonomous activation
- Starts transmitting after **5 sec** max after activation (FGB ELT = ~ 50 sec)
- **Higher transmission rate** than regular ELT:
 - Every **5 sec** between T= 0 to T=2 min
 - Every **10 sec** between T = 2 min to T = 5 min
 - Every **28.5 sec** after T = 5 min
- Possibly powered by aircraft in SBY
- Battery > 370 minutes in stand-alone mode
- Cancellation function when activation criteria are no longer valid
- Coded with **ICAO 24-bit** address (mode S) and **Operator 3LD**
- Provides **GNSS position and altitude** (ranges for FGBs)
- **Does not provide 121.5 MHz in flight**
- **Is not supposed to survive a crash**



ELT(DT) Design

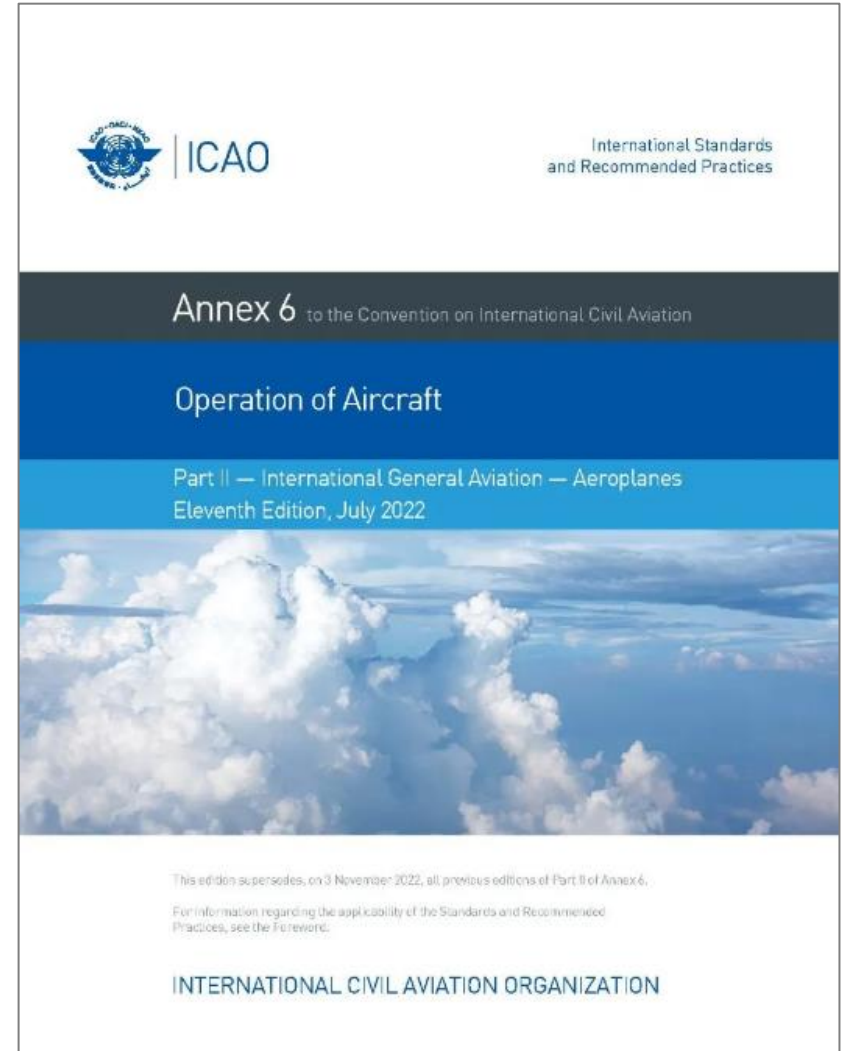
Enhanced ELT(DT)s:



1. **ELT(DT) designed to withstand a crash impact**
 - Regular ELT(DT) mode before a crash (>370 min)
 - ELT(DT) specific mode after “crash detection”
 - Every 5 sec between T = Crash and T = 30 min
 - Every 120 sec after T= 30 min (ELT(AF) = 50 sec)
 - Total operating time >24h (in-flight + after crash)
 - Keep same Hex ID
2. **ELT(DT) combined with ELT (AF)**
 - Regular ELT(DT) mode before a crash (>370 min)
 - Regular ELT(AF) mode after a “crash detection”
 - 3LD once every 2 bursts for 5 minutes
 - Cancellation message capability
 - Total operating time >30h (6h10 + after crash 24h)
 - Keep same Hex ID

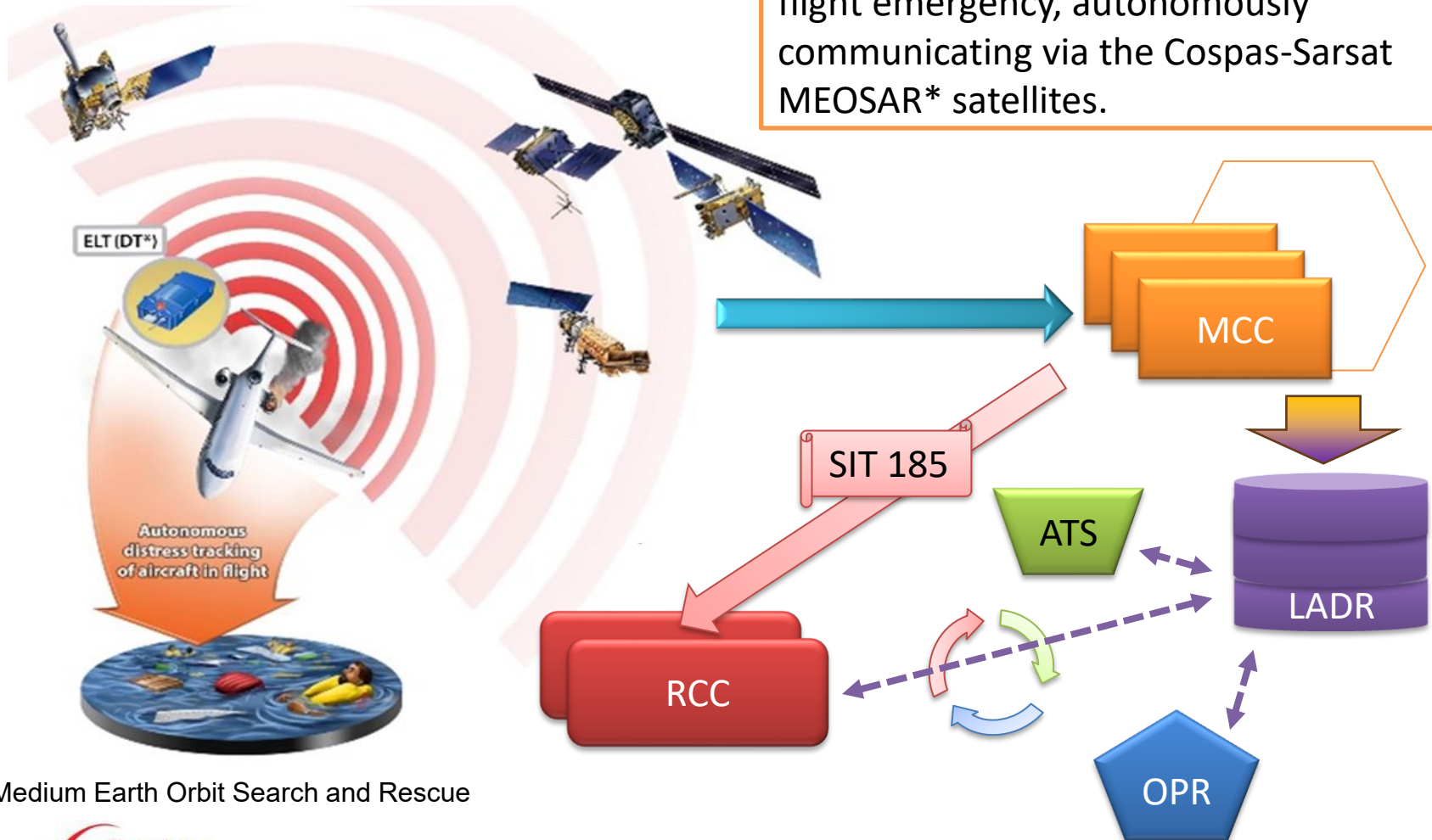
ELT(DT) Readiness

- Required ADT equipage date postponed to **1 Jan 2025**
 - applicable to all aircraft over 27,000 kg first issued with a Certificate of Airworthiness from **1 January 2024**.
 - Several major airframers indicated ELT(DT) onboard as early as **March 2023**
- => **FGB** ELT(DT) was declared at FOC by C/S on **1 January 2023**
- => **SGB** ELT(DT) was declared at FOC by C/S on **1 January 2024**.



ELT(DT) for Distress Tracking

ELT(DT)S activate after detection of an in-flight emergency, autonomously communicating via the Cospas-Sarsat MEOSAR* satellites.



* Medium Earth Orbit Search and Rescue

Guidance to ATS and RCCs

1. SIT 185 Paragraph 1 will contain “**DISTRESS TRACKING**”, and Paragraph 3 will clearly identify the source of the message as an “**ELT DISTRESS TRACKING**”

2. Study the basic event information provided in the ELT (DT) SIT 185:

- Paragraph 3 provides “**flag**” **State of the aircraft** decoded from the **ICAO 24-bit address**, and the **aircraft operator 3LD** from the rotating field.
- Paragraph 4 provides the **aircraft position (GNSS)**.

3. *Login to ICAO’s LADR to access all available information for this distress event, particularly the aircraft’s last known position (LKP).*

4. contact the appropriate **ATSU(s)** (and possibly the airline operator) per **ICAO Annexes 11 and 12** to determine more information about the possible distress event, *contact information for both ATS unit and operator should be available within the new Ops Control Directory* and listed in the RCC national/regional documentation and plans.

Guidance to ATS and RCC

5. *Monitor the LKPs in the LADR to assist in determining whether the aircraft is a **fixed or moving target**, in coordination with the appropriate ATSU and neighboring RCCs, as appropriate.*

6. If necessary, if LKPs are not in the LADR, RCCs/SPOCs should request that the MCC sends more of the data stored at the MCC level for the beacon event, to allow tracking of the flight using more of the information transmitted by the ELT(DT),

7. **Contact your supporting MCC** for any necessary clarifications about the content or the distribution of a SIT 185 message.

8. **Prepare for a SAR operation**, while monitoring incoming alerts for a possible cancellation message (SIT 185 **cancellation message**, Paragraph 1 will contain “**DISTRESS TRACKING COSPAS-SARSAT USER CANCELLATION ALERT**”).

9. As necessary, launch SAR activities per national procedures (and IAMSAR manual guidance)...

Independent Post-Crash Position

Because the Cospas-Sarsat System has been designed to provide an “independent” location (i.e., a location from the C/S System itself using Doppler & TOA/DOA processing - and not from internal GNSS-receiver from the beacon itself), **these “independent” locations will also be provided** for any ELT(DT) transmitting in **post-crash-activation mode**.

(Ground Segment equipment software upgrade is in progress).



• FGB ELT(DT) SIT Message

1. **DISTRESS TRACKING** COSPAS-SARSAT INITIAL ALERT
2. MSG NO 21013 CMCC REF 1D1220F03BBFDFE
3. BEACON MESSAGE INFORMATION
BEACON TYPE **ELT DISTRESS TRACKING**
AIRCRAFT 24 BIT ADDRESS 41E077 ASSIGNED TO G BRITAIN
AIRCRAFT OPERATOR DESIGNATOR MMB
HEX ID 1D1220F03BB**FDFE**
COUNTRY OF BEACON REGISTRATION 232/G BRITAIN
ACTIVATION TYPE **AUTOMATIC BY EXTERNAL MEANS (AVIONICS)**
GNSS POSITION PROVIDED BY EXTERNAL DEVICE
4. ALERT POSITION INFORMATION
DETECTED AT 04 AUG 23 101501 UTC BY MEOSAR
ALERT LAST DETECTED AT 04 AUG 23 101501 UTC
GNSS - 61 54.40 N 045 37.53 W
UPDATE TIME WITHIN 2 - 60 SECONDS OF DETECTION TIME
ALTITUDE OF GNSS LOCATION BETWEEN 1600 AND 2200 METRES
(BETWEEN 5200 AND 7200 FEET)
5. OTHER INFORMATION
GNSS POSITION UNCERTAINTY PLUS-MINUS 2 SECONDS OF LATITUDE AND
LONGITUDE
DETECTION FREQUENCY 406.0400 MHZ
6. REMARKS
THIS DISTRESS TRACKING MESSAGE IS BEING SENT TO APPROPRIATE
SAR AUTHORITIES. PROCESS THIS ALERT ACCORDING TO RELEVANT
REQUIREMENTS
END OF MESSAGE

• SGB ELT(DT) SIT Message

1. **DISTRESS TRACKING** COSPAS-SARSAT DOA POSITION MATCH ALERT
2. MSG NO 00192 AUMCC REF B274FA041FD4710
3. BEACON MESSAGE INFORMATION
BEACON TYPE **SGB - ELT DISTRESS TRACKING**
AIRCRAFT 24 BIT ADDRESS 7100CE ASSIGNED TO SAUDI ARABIA
AIRCRAFT OPERATOR DESIGNATOR SVA
TAC 16001 SERIAL NO 509
HEX ID **B274FA041FD4 7100CEA3F00**
COUNTRY OF BEACON REGISTRATION 403/SAUDI
ACTIVATION TYPE AUTOMATIC BY BEACON (G-SWITCH/PROBABLE CRASH)
4. ALERT POSITION INFORMATION
DETECTED AT 03 MAY 23 085310 UTC BY MEOSAR
ALERT LAST DETECTED AT 03 MAY 23 085310 UTC
GNSS - 02 24.40 N 046 04.11 E
TIME OF GNSS POSITION UPDATE: 03 MAY 23 085308 UTC
TIME SINCE GNSS LOCATION GENERATED: 0 MINUTES
ALTITUDE OF GNSS LOCATION: 125 METRES (410 FEET)
DOA - 02 25.1 N 046 06.2 E ESTIMATED ERROR 001NMS
5. OTHER INFORMATION
BEACON CHARACTERISTICS PER TAC DATABASE PROVIDED IN A SEPARATE MESSAGE
GNSS POSITION UNCERTAINTY PLUS-MINUS 10 METRES
ELAPSED TIME SINCE ACTIVATION: 0 HOURS
REMAINING BATTERY CAPACITY BETWEEN 75 AND 100 PERCENT
DETECTION FREQUENCY **406.05 MHZ**
ELT(DT) POSITION DOES NOT REFERENCE ANY PREVIOUS POSITION
6. REMARKS
THIS DISTRESS TRACKING MESSAGE IS BEING SENT TO APPROPRIATE
SAR AUTHORITIES. ROCESS THIS ALERT ACCORDING TO RELEVANT REQUIREMENTS.
END OF MESSAGE

Cospas-Sarsat RCC Handbook



**HANDBOOK ON DISTRESS ALERT MESSAGES
FOR
RESCUE COORDINATION CENTRES (RCCs),
SEARCH AND RESCUE POINTS OF CONTACT (SPOCs)
AND
IMO SHIP SECURITY COMPETENT AUTHORITIES**

C/S G.007
Issue 3
March 2022

Further guidance for RCCs are available in the Cospas-Sarsat RCC Handbook available on the Cospas-Sarsat/Pro website [<here>](#) (See also document C/S A.002 for SIT185 messages)

ELT(DT) Inappropriate Activations

By design, an ELT(DT) should transmit **less than 1 false activation per 50.000 hrs** of flight (i.e., once in a 12-year beacon lifetime operated 12hrs a day).

Too many inappropriate manual activations (on ground / even manually in flight) have been detected since 2023.

Appropriate discussions are in progress with aircraft manufacturers and airline operators to **remedy this important concern for the C/S System and SPOCs/RCCs and ATSU.s.**



Conclusion

ELT(DT):

- is the ADT System by C/S
- For A/C > 2024
- Activated in flight by avionics
- Transmits more 'bursts' than a regular ELT(AF)
- Cancellation function available
- Information via SIT 185
- LKPs are available in the LADR
- RCCs and ATSU's must log in the LADR
- **Limit false activations**
- **No live-testing**

