Autonomous Distress Tracking (ADT) of Aircraft in Flight & SIT 185

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KINGDOM OF SAUDI ARABIA

Agenda

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- ELT(DT).
- Location of aircraft in distress repository (LADR).
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- Proposed action after receipt of SIT 185 Messages.
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Introduction

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 a distress. ***(ICAO Annex6).***

This function is designed to identify the location of an aircraft in distress within a 6 NM radius of the accident site.

The key stakeholders involved in ADT implementation are:

Air Traffic Service Units (ATSUs)

Aircraft Operators (airline companies, not the crew)

ADT service providers

Search and Rescue (SAR) services.

ELT(DT)

As of 1 January 2023, **Cospas-Sarsat** declared readiness to operationally process and distribute data from a new beacon type, the ELT(DT).

ELT for Distress Tracking (DT) was specifically developed to support new ICAO Standards as part of its GADSS initiative. (ELT(DT)s) are compliant with ICAO GADSS requirements for Autonomous Distress Tracking (ADT) to transmit accurate position information at least every minute, which should allow an aircraft crash site to be located within six nautical miles (6 NM).

ELT (DT) has been selected by major aircraft manufacturers.

ELT(DT)s are designed to be activated, either automatically or manually, while the aircraft is still in flight.

ELT(DT) messages: As with all Cospas-Sarsat alerts, ELT(DT) messages shall be distributed directly to SAR authorities by MCCs in accordance with document C/S A.001.

ELT (DT) alert: An ELT (DT) alert is triggered when an aircraft in-flight enters a state which, if no corrections are made to return that aircraft to a safe flight state, an accident is likely to occur.

Location of aircraft in distress repository (LADR)

ICAO

- ICAO LADR, currently being developed by EUROCONTROL, and not yet ready to accept position information from an ADT device transmitting from an aircraft in distress and notify the appropriate subscribers. However, the LADR is expected to be available and in full operational in 2024.

Cospas-Sarsat

- When the LADR becomes available, Cospas-Sarsat will place data from each ELT(DT) transmission there and continue to alert SPOCs and RCCs directly.

SAR Authorities

- Until the LADR becomes available, SAR authorities should consider developing interim procedures to appropriately respond to distress ELT(DT) messages emanating from an aircraft still in flight to supplement existing SAR procedures. RCCs should note that the responsibility for coordinating aircraft in-flight emergencies continues to be maintained by ATS while the aircraft is airborne.

Subject Indicator Type 185 (SIT185)

Usually, The Responsible Agency receives beacon alerts from its associated MCC, and the information that is distributed by an MCC is structured in a format known as Subject Indicator Type (SIT) format

In particular, the information that is sent from an MCC to a Responsible Agency is usually a plain text message in a format known as a SIT 185 format

The SIT 185 format provides information about an active beacon, e.g., date, time, beacon ID, satellite system providing the information, and position estimate.

There are three beacon message types:

- Distress
- Distress Tracking
- Ship Security

Subject Indicator Type 185 (SIT185)

The SIT 185 Format consists of 6 paragraph

Cont'd

SAMPLE MESSAGE FOR SIT 185

Message Type → 1. DISTRESS COSPAS-SARSAT POSITION UPDATE ALERT

Message Number and MCC reference → 2. MSG NO 00932 AUMCC REF 9D064BED62EAFE1

3. BEACON MESSAGE INFORMATION ← Beacon MSG Info

BEACON TYPE USER LOCATION - ELT USER

AIRCRAFT REGISTRATION VP-CGK/1

HEX ID 9D064BED62EAFE1

COUNTRY OF BEACON REGISTRATION 232/ G.BRITAIN

BEACON NUMBER ON AIRCRAFT OR VESSEL 0

HOMING SIGNAL 121.5 MHZ

ACTIVATION TYPE MANUAL

Alert Position Information → 4. ALERT POSITION INFORMATION

DETECTED AT 10 MAY 07 0654 UTC BY LEOSAR SARSAT 11

MCC REFERENCE - 25 13.1 N 055 22.2 E

DOPPLER A - 25 17.1 N 055 23.2 E PROB 90 PERCENT

Other information → 5. OTHER INFORMATION

DETECTION FREQUENCY 406.0246 MHZ

Remarks → 6. REMARKS NIL

END OF MESSAGE

RCC actions to be taken after receipt of a SIT 185 message from an ELT(DT) could include the following:

Identify

1. Note that the SIT 185 message reports the detection of a signal from the new beacon type, the ELT(DT); Paragraph 1 of the SIT 185 message contains “DISTRESS TRACKING” and Paragraph 3 clearly identifies the source of the message as “ELT DISTRESS TRACKING”.

Review

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

a. Paragraph 3 will provide the State of registration the aircraft decoded from the ICAO 24-bit address, and the operator, both contained in the beacon message,

b. Paragraph 4 will provide the aircraft position.

Communicate

3. Contact the appropriate ATS unit(s) and the operator per ICAO Annexes 11 and 12 to exchange further information about the possible (or confirmed) distress event. The contact information for both ATS unit and operator should be available within the new Ops Control Directory and/or listed in the RCC documentation and plans.

Coordinate

4. If necessary, request that the sending MCC send more of the data stored at the MCC level for the beacon event , to allow tracking of the flight using all (or more) of the information transmitted by the ELT(DT).

5. Contact your supporting MCC for any necessary clarifications about the content of a SIT 185 message.

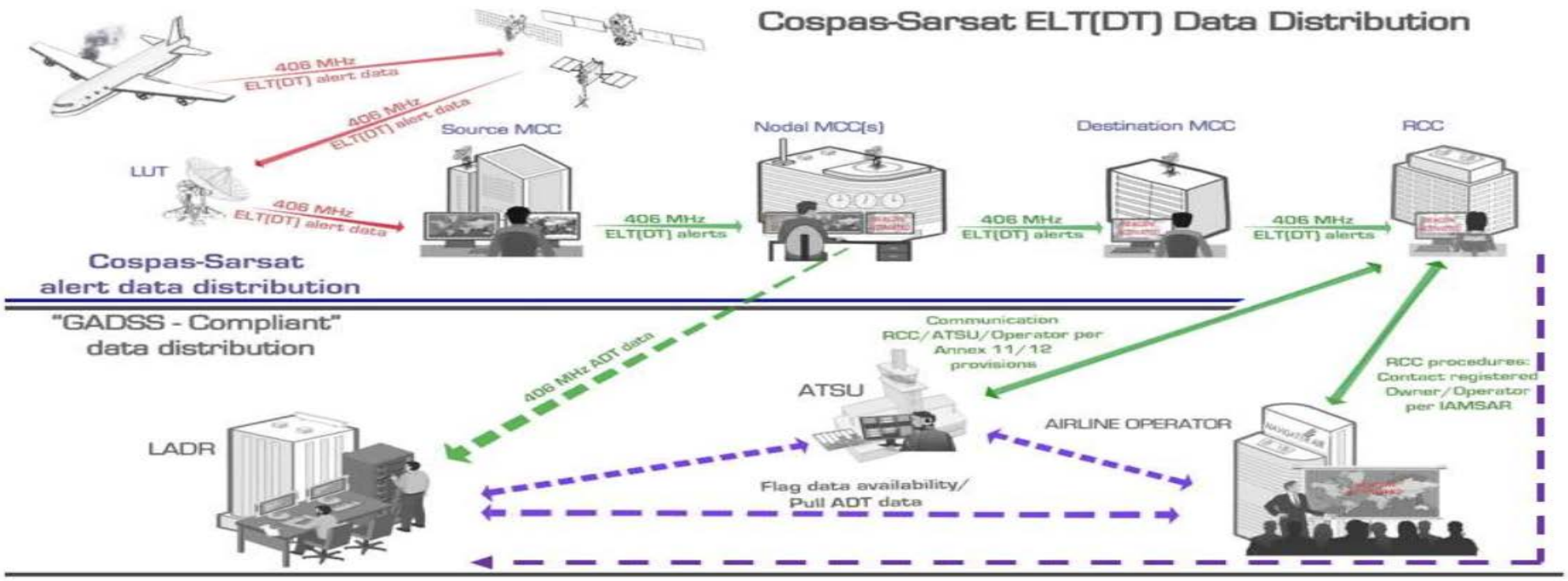
Prepare

6. Prepare for a SAR operation, while monitoring incoming messages for a possible cancellation message (in a SIT 185 Cancellation Message, Paragraph 1 contains “DISTRESS TRACKING COSPAS-SARSAT USER CANCELLATION ALERT”).

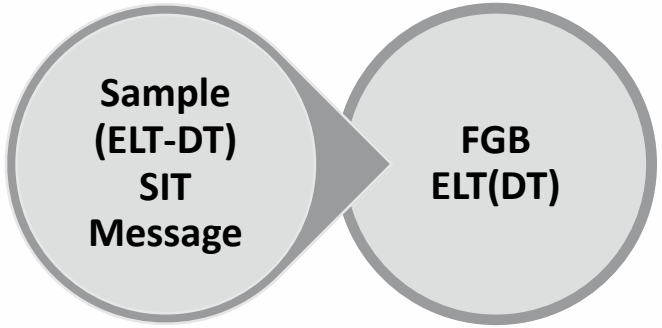
Note: *For ELT(DT) activations over maritime areas, and where there is no JRCC established, the responsible ARCC should notify its partner MRCC.*

Note: *ICAO did not specify a technology for the ADT capability (Performance Based), accordingly multiple technical solutions exist, thus SAR Authorities and services should be mindful that they may receive ADT alerts from sources other than Cospas-Sarsat.*

Cospas-Sarsat ELT(DT) Data Distribution

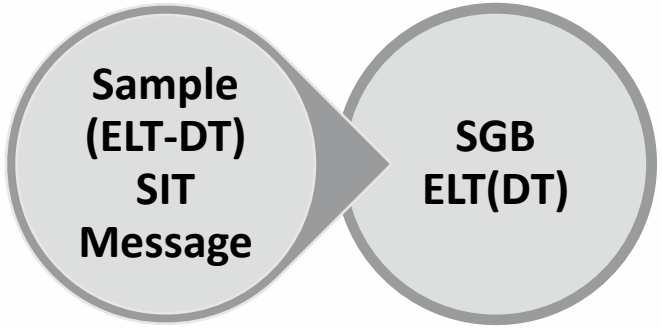


Sample (ELT-DT) SIT 185 Message



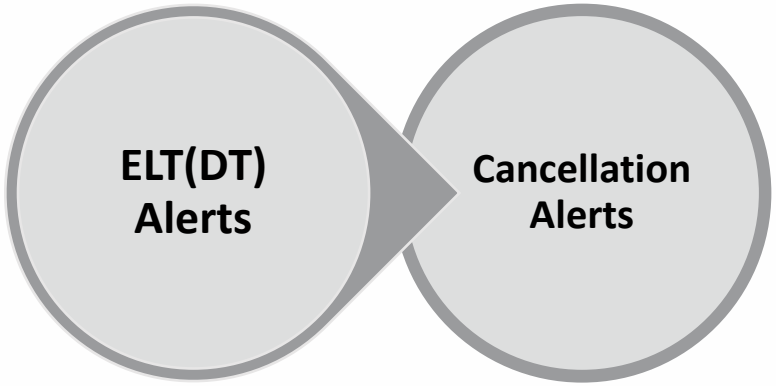
1. DISTRESS TRACKING COSPAS-SARSAT POSITION UPDATE ALERT
2. MSG NO 21013 CMCC REF 1D1200F03BBFDFF
3. BEACON MESSAGE INFORMATION
BEACON TYPE ELT DISTRESS TRACKING
AIRCRAFT 24 BIT ADDRESS 01E077 ASSIGNED TO G BRITAIN
AIRCRAFT OPERATOR DESIGNATOR MMB
HEX ID 1D1200F03BBFDFF
COUNTRY OF BEACON REGISTRATION 232/G BRITAIN
ACTIVATION TYPE MANUAL
GNSS POSITION PROVIDED BY EXTERNAL DEVICE
4. ALERT POSITION INFORMATION
ALERT LAST DETECTED AT 04 AUG 20 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

Sample (ELT-DT) SIT 185 Message



1. DISTRESS TRACKING COSPAS-SARSAT DOA POSITION MATCH ALERT
2. MSG NO 00192 AUMCC REF B27400F81FD4710
3. BEACON MESSAGE INFORMATION
BEACON TYPE SGB – ELT DISTRESS TRACKING
AIRCRAFT 24 BIT ADDRESS 7100CE ASSIGNED TO SAUDI ARABIA
TAC 62 SERIAL NO 509
HEX ID B27400F81FD4 7100CE00000
COUNTRY OF BEACON REGISTRATION 403/SAUDI
ACTIVATION TYPE AUTOMATIC BY BEACON (G-SWITCH/PROBABLE CRASH)
4. ALERT POSITION INFORMATION
DETECTED AT 03 MAY 24 085310 UTC BY MEOSAR
ALERT LAST DETECTED AT 03 MAY 24 085310 UTC
GNSS - 02 24.40 N 046 04.11 E
TIME OF GNSS POSITION UPDATE: 03 MAY 24 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 UNKNOWN
ALTITUDE NIL
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 406.0510 MHZ
ELT(DT) POSITION DOES NOT REFERENCE ANY PREVIOUS POSITION
6. REMARKS
THIS DISTRESS TRACKING MESSAGE IS BEING SENT TO APPROPRIATE SAR AUTHORITIES.
PROCESS THIS ALERT ACCORDING TO RELEVANT REQUIREMENT

ELT(DT) Alerts | Cancellation Alerts



1. DISTRESS TRACKING COSPAS-SARSAT USER CANCELLATION ALERT
2. MSG NO 00192 AUMCC REF B27400F81FD4710
3. BEACON MESSAGE INFORMATION
BEACON TYPE SGB - ELT DISTRESS TRACKING
AIRCRAFT 24 BIT ADDRESS 7100CE ASSIGNED TO SAUDI ARABIA
TAC 62 SERIAL NO 509
HEX ID B27400F81FD4 7100CE00000
COUNTRY OF BEACON REGISTRATION 403/SAUDI
ACTIVATION TYPE AUTOMATIC BY EXTERNAL MEANS (AVIONICS)
4. ALERT POSITION INFORMATION
DETECTED AT 03 MAY 24 085810 UTC BY MEOSAR
ALERT LAST DETECTED AT 03 MAY 24 085310 UTC
DOA – 02 25.1 N 046 06.2 E ESTIMATED ERROR UNKNOWN
ALTITUDE NIL
5. OTHER INFORMATION
ELT(DT) POSITION DOES NOT REFERENCE ANY PREVIOUS POSITION
CANCELLATION CONFIRMED
BEACON CHARACTERISTICS PER TAC DATABASE PROVIDED IN A SEPARATE MESSAGE
REMAINING BATTERY CAPACITY BETWEEN 75 AND 100 PERCENT
DETECTION FREQUENCY 406.0510 MHZ
6. REMARKS
THIS DISTRESS TRACKING MESSAGE IS BEING SENT TO APPROPRIATE SAR AUTHORITIES
PROCESS THIS ALERT ACCORDING TO RELEVANT REQUIREMENTS
END OF MESSAGE

Thank You

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