



DECLARATION OF DESIGN AND PERFORMANCES(DDP)

FOR

ELiTe ELT in SURVIVAL CONFIGURATION

- Composed of**
- One ELiTe TRANSMITTER**
- One ELiTe Float**
- One ELiTe Coding Tag**
- One ELiTe S-BRACKET**
- Or One ELiTe S-BAG**

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1 Revision History

REV	Date	Description
A draft 1	July, 2016	Creation (Preliminary)
A Preliminary	Jan 10, 2017	Incorporation of EASA remarks
B	June 14, 2017	Incorporation of Customers and EASA remarks: Limitations and list of non ETSO functions added New Template
C	July 20, 2017	Incorporation of EASA remarks

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2 Purpose

This document is the declaration of design and performance (DDP) of the ELTA ELiTe ELT in Survival Configuration.

2.1. Relevant ETSO numbers

ETSO-C126b
ETSO-C142a

2.2. Applicable technical specifications

EUROCAE ED-62A
RTCA DO-204A
RTCA DO-227

3 Manufacturer information

Manufacturer:
ELTA F6614

Manufacturer address:
15, Avenue du Docteur Maurice Grynfogel
ZAC de BASSO CAMBO
31035 TOULOUSE CEDEX 1
FRANCE

Equipment designation : ELT
Model : ELiTe ELT, SURVIVAL CONFIGURATION (S Type)

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3.1. Vendor part number(s)

The ELiTe ELT in Survival Configuration is composed of the following part numbers:

- P/N 12N67880 Rev (X) ELiTe TRANSMITTER
- P/N 12N67910 Rev (X) ELiTe S-BRACKET
- P/N 12N67920 Rev (X) ELiTe S-Bag (alternative to S-BRACKET)
- P/N 15N62610 Rev (X) ELiTe Float
- P/N 12N67890 Rev (X) ELiTe Coding Tag

Note : Rev (X) corresponds to Minor Engineering change order management (amendment). It keeps fit- form – function. It keeps full interchangeability.

P/N	Designation	ETSO-C142a	ETSO-C126b
12N67880 Rev (X)	ELiTe TRANSMITTER	X	X (Class 2 and Class A)
12N67890 Rev (X)	ELiTe Coding Tag	-	X (Class 2 and Class A)
15N62610 Rev (X)	ELiTe Float	-	X (Class 2 and Class A)
12N67910 Rev (X)	ELiTe S BRACKET	-	X (Class 2 and Class A)
12N67920 Rev (X)	ELiTe S Bag	-	X (Class 2 and Class A)
15N63626 Rev (X) (ELiTe Battery servicing kit 17N20439 Rev (X))	ELiTe Battery pack	X	-

Note 1: 15N63626 is a subpart of 12N67880.

Note 2: 12N67920 is an alternative solution to ELiTe S-BRACKET 12N67910

Note 3: 17N20439 is a servicing kit composed of the following items: 15N63626 and Label Battery Servicing 14P60437.

3.2. Manufacturer specifications

Transmitter Specification	12E68376 issue R
Survival Bracket Specification	12E68378 issue H
Storage and transportation bag sepcifiation	13E65961 issue H
Technical Specification for C/S Identification Tag	14E61057 issue D
User Interface Beacon Specification	13E65598 issue P

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4 Technical description

4.1. Brief technical description

The ELiTe ELT in Survival Configuration is a dual (2) frequencies ELT operating on 121.5 & 406.040 MHz. It is a SURVIVAL (S) basic type. It incorporates an embedded antenna that can transmit both on 121.5 MHz and 406.040 MHz.

A water sensor allows additional activation capabilities.

The ELiTe ELT in Survival Configuration can transmit location information inside COSPAS/SARSAT (C/S) long message in any User Location or Standard Location Protocols, using one internal complete GNSS Receiver. The ELiTe TRANSMITTER frequencies are in accordance with relevant ITU standard .

4.2. General parameters

PARAMETER	SELECTED VALUE	REMARKS
Operating temperature	-20°C; +55°C	Class 2
Storage temperature	-55°C ; +85°C	in accordance with ED-62A/DO-204A +80°C for battery packs, 20°C recommended for uninstalled ELT in order to limit the battery self discharge
Applicable standard	EUROCAE ED-62A/DO-204A	for the tests applicable to "Survival" basic type ELT Class A (buoyant)
Batteries used	2 "D" cells in serie	Solid cathode L ₁ MnO ₂
Battery pack	ETSO-C142a marking: Lithium battery non rechargeable, battery voltage and capacity, positive terminal polarity, amount of lithium, class, warnings, date of manufacture	
Batteries compartment	On the bottom of the electronics	Removable without acces to the electronics

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Manual self-test	Activated by pushing the push button "TEST or RESET" on ELiTe TRANSMITTER. Check of the - output power (& related batteries voltage & capacity), 406 MHz Frequency during a modulated 406 transmission with inverted frame synchronization (selftest pattern), C/S identification 0.75s of 121.5 MHz is sent during self test.	Automatic return to ARMED. Correct self test display: 3s green ELT LED and display message "selftest OK" Failed self test display: 3s red ELT LED and display message "selftest KO"
Delay prior first distress signal transmission	50 s after the self test report	
Display on beacon	Visual (Light strobe and display message)	ELT distress transmission, light strobe 1ms active every 15s

4.3. 121.5 MHz Transmitter (HOMING)

Emission type (per ITU): 3K20A3X.

"A" double side band; "3" single channel, analog information, "X" other (audio sweep).

PARAMETERS	SELECTED VALUE	REMARKS
Carrier Frequency	121.5 MHz \pm 6 KHz	In accordance with ED-62A/DO-204A
Medium term slope	< 0.2 ppm/mn	In accordance with ED-62A/DO-204A
Medium term standard deviation	< 0.05 ppm	In accordance with ED-62A/DO-204A
PT Beacon output power (Primary Antenna acces / 50 Ω).	N/A there is no 50 Ω Access as we are using one internal antenna	
EIRP	EIRP = 21,5dBm at 20° elevation angle	In accordance with ED-62A/DO-204A
Primary antenna	Internal	
Modulation	Amplitude	In accordance with ED-62A/DO-204A
Transmission	Duty Cycle 33% 0.75s ON, 1.5s OFF	In accordance with ED-62A/DO-204A
Frequency modulation	Audio	In accordance with ED-62A/DO-204A

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Excursion	Between 350 and 1250 Hz	In accordance with ED-62A/DO-204A
Repetition rate	3 Hz	In accordance with ED-62A/DO-204A
Utilisation coefficient	> 50 Hz	In accordance with ED-62A/DO-204A
Component	Symetrical	In accordance with ED-62A/DO-204A
Power repartition	> 50 %	In accordance with ED-62A/DO-204A
Warm-up time	5 mn	In accordance with ED-62A/DO-204A
Minimum operating life time at -20°C	>= 60 H	Taking into account 1 self-test every 6 months and 5 years old batteries (48 hours required in ED-62A/DO-204A)

4.4. 406.040 MHz Transmitter

COSPAS-SARSAT Type Approval Number : 291.

Emission type (per ITU): 16K0G1D.

“G” phase modulation; “1” single channel with digital information, “D” Data transmission).

PARAMETERS	SELECTED VALUE	REMARKS
Primary antenna	Internal	
Warm-up time	5 mn	15 mn required in ED-62A/RTCA DO-204A
Minimum operating life duration at -20°C	24 H and 30 mn	Taking into account 1 self-test every 6 months and 5 years old batteries (24 hours required in C/S T.001)
PT Beacon output power (Antenna acces / 50 Ω)	N/A there is no 50 Ω Access as we are using one internal antenna	
EIRP	EIRP between 32.3 dBm and 41.1 dBm in “Water” ground plane Configuration 1 C/S T001	Burst transmission, in accordance with COSPAS-SARSAT latest requirements

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Other parameters:		in accordance with COSPAS-SARSAT latest requirements (C/S T.001)
<ul style="list-style-type: none"> • Frequency • CW preamble • Repetition rate • Burst transmission duration • First Burst delay • Bit rate • Modulation • Short term stability • Medium term stability • Residual freq. Variation • Country code • Protocol 	<ul style="list-style-type: none"> 406.040 MHz \pm 1 KHz 160 mS \pm 1% 50 s \pm 2.5s 520 ms \pm 1% 50 s \pm 2.5s. 400 Hz \pm 1% Biphase-L \pm 1 rd [\pm 1 rd] Better than 2.10^{-9} Better than $\pm 10^{-9}$ Better than 3.10^{-9} Any, Selectable Any User Location, Standard Location, Selectable 	modified at each burst long message
C/S Type Approval N°	291	In accordance with ICAO/IMO Aeronautical only

4.5. Performance

The performances of the ELiTe ELT in survival configuration equipment conforms with EUROCAE ED-62A & RTCA DO-204A specifications (ELT) and RTCA DO-227 (internal battery).

The ELiTe ELT, in Survival Configuration, complies with ETSO C126b, ETSO C142a requirements and is type approved by C/S.

4.6. Guaranteed weight

Max. 1800 g for one ELiTe TRANSMITTER + one ELiTe Float + one ELiTe Coding Tag + one ELiTe S-BRACKET.

Max. 1800 g for one ELiTe TRANSMITTER + one ELiTe Float + one ELiTe Coding Tag + one ELiTe S-BAG.

4.7. Overall dimensions

279 mm x 199 mm x 97 mm (ELiTe S-BRACKET)

300 mm x 205 mm x 130 mm (ELiTe S-BAG, alternative to ELiTe S-BRACKET)

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4.8. Limitations for operating

None

4.9. Limitations for handling

None

4.10. Non ETSO functions

The list of non ETSO functions implemented in the ELiTe ELT in Survival Configuration are:

- Actual location from internal GNSS receiver (internal navigation device) no safety effect
- Water Activation
- Internal dual frequency (121,5 MHz -406 MHz) antenna
- Strobe light
- LCD Display
- Embedded maintenance follow up functions (log)
- C/S identification RFID Tag
- Auto Armament function
- Embedded battery pack follow up (date of manufacture, expiry date, remaining capacity, number of self-test, cumulative distress transmission time)
- GNSS selftest
- ATA Spec 2000 RFID tag (Part identification)

4.11. Deviation from specification

None

4.12. Open problem report with user impact

None

4.13. Minor changes

The items listed here under are to be considered as minor changes if implemented for the ELiTe ELT in Survival configuration:

- Components obsolescence management

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5 Documentation

5.1. Safety/Failure analysis

FMEA (and Appendix) 13E66065 version G
 Safety memorandum focusing on non rechargeable Lithium Battery 14E64027 version B

5.2. Quality control procedure

ELiTe ATS 13E65797 version J
 ELiTe TRANSMITTER ATP 14E64621 version E
 ELiTe TRANSMITTER upper part (Transmitting Pack) ATP 14E64623 version D
 ELiTe Battery Pack ATP 15E65612 version B

5.3. Maintenance and operation instructions

ACMM 25-60-15 ELiTe TRANSMITTER
 CMM 25-60-17 ELiTe Coding Tag

5.4. Instruction manual

User handbook 15E64259 issue A

5.5. Quality Configuration documentation

Configuration Index Documentation 13Q67047 version K (CID)
 Including Master drawing records, safety procedure analysis and quality control procedure

5.6. Software documentation

Software criticality: D per ED-12C / DO-178C except GNSS software whose failure are not affecting the minor failure conditions defined in ETSO-C126b.

Software accomplishment summary 13E64430 version E (SAS)

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Software quality assurance plan	13E61849 version G	(SQAP)
Software configuration management plan	13E61848 version G	(SCMP)
Software configuration index	13E64428 version R	(SCI)
Plan for Software Aspects of Certification	13E61842 version J	(PSAC)

5.7. Hardware documentation

Hardware criticality: D per ED-80 / DO-254

Hardware accomplishment summary	16E29031 version B	(HAS)
Configuration management plan	14E60755 version D	(CMP)
Plan for Hardware Aspects of Certification	13E60397 version D	(PHAC)

5.8. Remarks

None

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6 Statement of compliance

Refer to ETSO qualification and qualification test report 16E25551 Rev B for details.

During the qualification test campaign, the following requirements have been applied:

- The circuits of the equipment under test were aligned and adjusted and no other adjustments were performed on the ELT after initiation of the tests.
- Connection of test instruments to the equipment under test was checked.
- All tests were performed with the proper impedance load values.

6.1. Environment Qualification Form as per ED-14G/DO-160G

* special per EUROCAE ED-62A or RTCA DO-204A

QUALIFICATION TEST DESIGNATION	ED-14G DO-160G SECTION	ED-14G / DO-160G CATEGORY	REPORT document. METHOD (S)imilarity (T)est
Temperature, altitude & decompression	4	special Eurocae ED-62A/DO-204A	(S) 16E25551 Rev B, § 5.1.1, 5.1.2 & 5.1.3
Ground Survival Low Temperature	4.5.1	equipment identified to category D2	(S) 16E25551 Rev B, §5.1.1.5
Operating Low Temperature	4.5.2	equipment identified to category D2	(S) 16E25551 Rev B, §4.1.1.3
Ground Survival High Temperature	4.5.3	equipment identified to category D2	(S) 16E25551 Rev B, §5.1.1.6
Operating High Temperature	4.5.4	equipment identified to category D2	(S) 16E25551 Rev B, §4.1.1.4
Temperature variation	5	special Eurocae ED-62A/DO-204A	(S) 16E25551 Rev B, §5.3.3
Temperature variation	5.3.1	Equipment Tested to category B (ELT Op. Temp. +55°C; -20°C)	(S) 16E25551 Rev B, §5.4.8
Humidity	6	Equipment tested to category A	(T) 16E25551 Rev B, §5.2.1
Operational shocks and crash safety	7	special Eurocae ED-62A/DO-204A equipment tested to 50 g/11 ms and 100g/23ms	(T) 16E25551 Rev B, §5.2.7.2
Low Frequency Crash Safety	7.3	Equipment tested to Category E	(T) 16E25551 Rev B §5.4.7.2

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QUALIFICATION TEST DESIGNATION	ED-14G DO-160G SECTION	ED-14G / DO-160G CATEGORY	REPORT document. METHOD (S)imilarity (T)est
Constant acceleration (sustained)	7.3.3	Equipment tested to A/C Type 5, Test type R	(T) 16E25551 Rev B, §5.4.4
Vibrations	8	Equipment tested to category R curves C/C1 , category U2 curves F/F1 and category H per analysis (for fan blade loss)	(T) 16E25551 Rev B, §5.1.5
Explosion proofness	9	N/A	Ok by similarity with ELiTe AF
Waterproofness	10	equipment tested to category R	(T) 16E25551 Rev B, §5.2.2.2
Fluid susceptibility	11	N/A	-
Sand & Dust	12	N/A	-
Fungus resistance	13	N/A	-
Salt spray	14	equipment tested to category T	(T) 16E25551 Rev B, §5.2.6
Magnetic effects	15	equipment tested to category A	(T) 16E25551 Rev B, §5.1.6
Power input	16	N/A	-
Voltage spike	17	N/A	-
Audio frequency conducted susceptibility-power inputs	18	N/A	-
Induced signal susceptibility	19	equipment tested to category CW	(S) 16E25551 Rev B, §5.1.10
Radio frequency susceptibility (radiated & conducted)	20	equipment tested to category R	(S) 16E25551 Rev B, §5.1.11
Emission of radio frequency energy	21	Special Eurocae ED-62A/DO-204A (Radio Frequency Energy 121.5 MHz)	(T) 16E25551 Rev B, §5.1.14
Lightening induced transient susceptibility	22	N/A	-
Lightening direct effects	23	N/A	-
Icing Test	24	N/A	-
Electrostatic Discharge Test	25	equipment tested to category A	(T) 16E25551 Rev B, §5.4.6
Flammability	26.9	Equipment tested to category C	(T) 16E25551 Rev B, §5.4.1
Flame	None	special Eurocae ED-62A/DO-204A	(T) 16E25551 Rev B, §5.10
Operating Life Time	None	special Eurocae ED-62A/DO-204A	(T) 16E25551 Rev B, §5.3.1

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6.2. Approval

I, Pierre PIPARD, HEREBY CERTIFY, THAT THE INFORMATION CONTAINED IN THIS DECLARATION OF DESIGN AND PERFORMANCE COMPLIES WITH THE REQUIREMENTS OF THE TECHNICAL SPECIFICATIONS CALLED TO MEET ETSO C126b, ETSO C142a REQUIREMENTS AND IS MADE UNDER THE AUTHORITY OF ELTA. DEVIATIONS TO THE REQUIREMENTS IF ANY, ARE DECLARED HEREIN. WITHOUT WRITTEN AGREEMENT, I DECLINE ALL RESPONSIBILITY IN THE EVENT OF UNSATISFACTORY OPERATION OF THE EQUIPMENT BEYOND OPERATIONAL CONDITIONS AND LIMITATIONS INDICATED ABOVE.

	NAME	SIGNATURE	DATE
SUPPLIER	Pierre PIPARD		October 06 th , 2017
SUPPLIER (QUALITY ASSURANCE)	T. JEAN PART 21, PART 145, FAR 145 Quality Manager		October 06 th , 2017

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