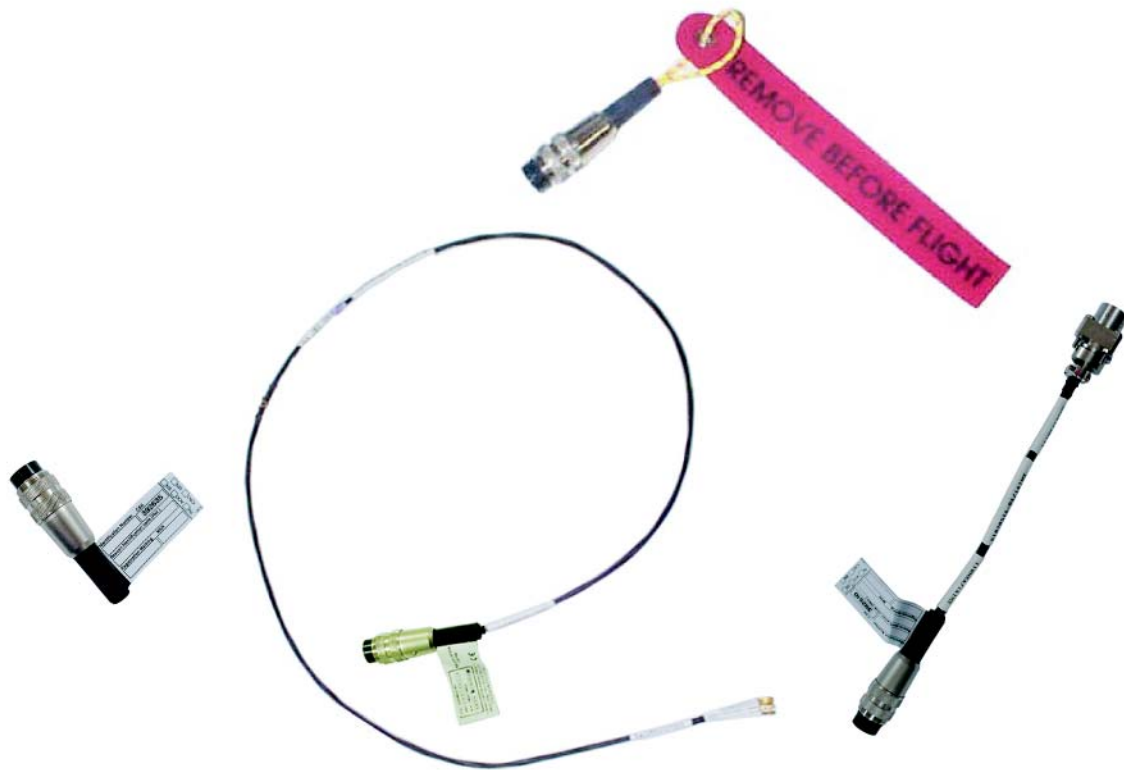# F8794

DONGLES

TECHNICAL PRESENTATION

P/N S1820514-01: Programming dongle
P/N S1820514-02: Maintenance dongle
P/N S1820514-04: Programming dongle A320

P/N S1820514-05: Programming dongle A330 A340

First Issue : NOV 06/00
Revision : C
REF: DOC00273

Users are kindly request to notify MARTEC SERPE-IESM for any discrepancy, omission or error found in this manual.

Please report to our customer support:

E-mail: support.sar@martec.fr

Tel.: +33 (0)2 97 02 49 00

DONGLES
TECHNICAL PRESENTATION

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TECHNICAL PRESENTATION

LIST OF REVISIONS

Rev	Date	Pages	Description of modifications
A	10/3/02		First issue
B	MAY 04/03		Structure of manual
C	SEP 21/2006	13	Pin J1-B to J1-F, J1M : Direction of signal modification

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DONGLES
TECHNICAL PRESENTATION

1. GENERAL

### 1.1. Background

1.1.1. COSPAS-SARSAT system

Launched in the early eighties by the four founder countries (Canada, France, Russia, USA), the COSPAS-SARSAT system provides satellite aid to search and rescue (SAR) operations for maritime, aeronautical and terrestrial vehicles anywhere in the world.

It uses distress beacons fitted on mobiles and a constellation of LEO and GEO satellites which relay the 121.5 / 243 MHz signals and process the 406 MHz signal to ground stations (LUT) where the beacon positions are determined (with a precision of 10 NM with 121.5 / 243 signals and less than 2 NM with 406 signals).

Several types of beacons are designed to match the various applications of the COSPAS-SARSAT system:

- EPIRB (Emergency Position Indicating Radio Beacon) for maritime applications.
- ELT (Emergency Locator Transmitter) for aeronautical applications.
- PLB (Personal Locator Beacon) for land expeditions.

Figure 1: COSPAS-SARSAT system
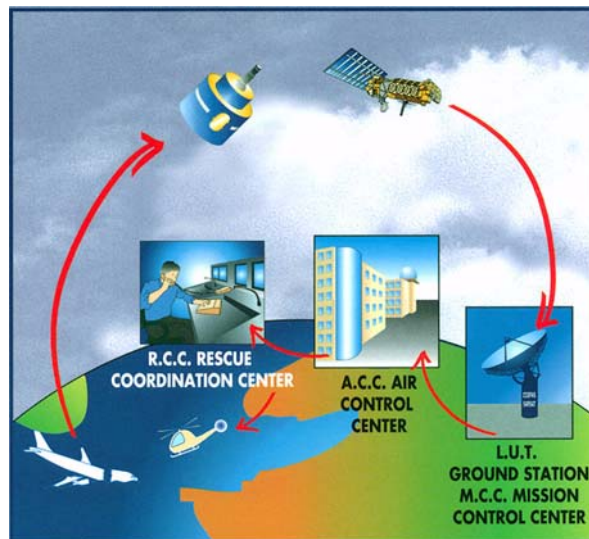
1.1.2. Digital message

The identification of the aircraft in distress is transmitted via the 406 MHz digital message. This implies that each ELT has to be individually programmed prior to its installation on board the aircraft.

The standard way to program an ELT is to connect it to a PC (or portable PC) though a specific interface (PR550). In case of removal and/or standard exchange, the ELT removed has to be "deprogrammed" and the installed ELT has to be reprogrammed with the aircraft detail. This requires the availability of the PR550 and trained operator with specific skills.

SERPE-IESM has developed a system of "dongles" (connector with memory, also known as "smart connector" or "configuration plug") so that the operator is not involved in programming / deprogramming operations. This feature is compatible with the complete range of KANNAD 406 ELTs.

1.1.3. ELT system

The ELT system is composed of 6 Line Replaceable Units (LRU) :

(1) a transmitter;

(2) a mounting bracket;

(3) a remote control panel;

(4) an outside antenna;

(5) a "Programming Dongle" for pin-programming function (manadatory with a CS144 interface);

(6) CS144 Interface Module (option).

The transmitter, bracket, Programming Dongle and CS144 Interface Module are installed in the aircraft near the tail. The outside antenna is mounted on the fuselage near the tail. The remote control panel is installed in the cockpit and connected to the ELT with a 4 or 5 wire bundle.

Figure 2: ELT system description
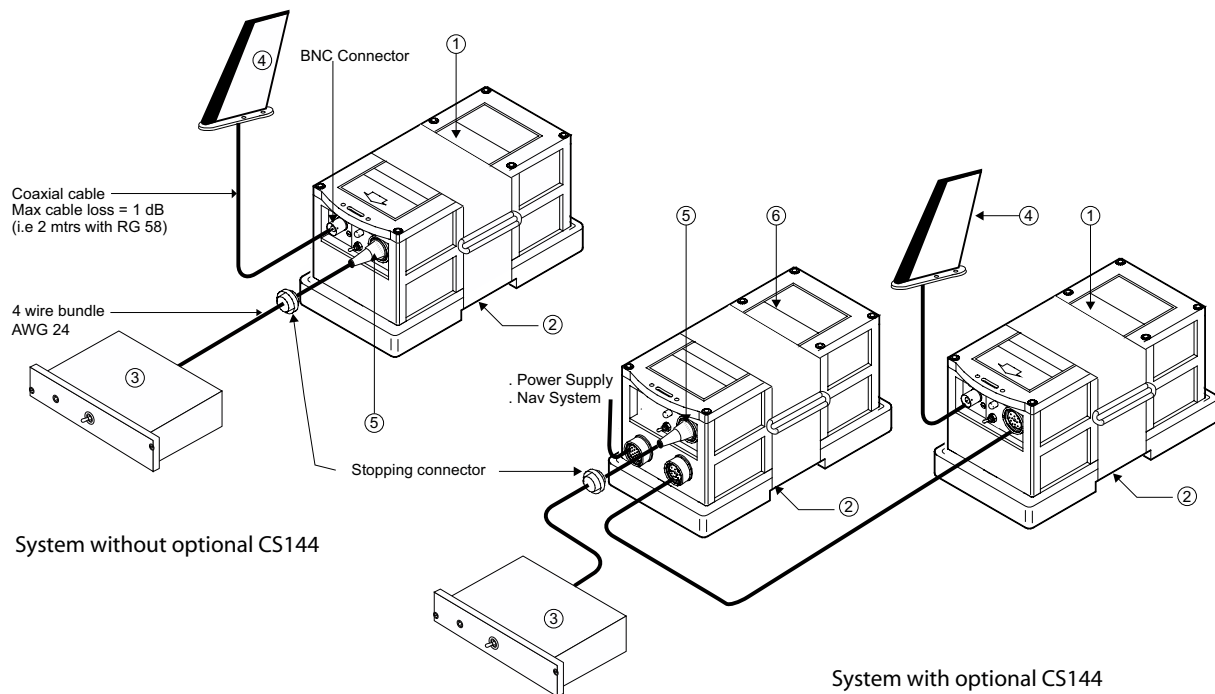
This document is a technical presentation of:

- programming dongle, P/N S1820514-01;

- maintenance dongle, P/N S1820514-02;

- programming dongle A320, P/N S1820514-04, to be installed on AIRBUS A319, A320 and A321 aircraft;

- programming dongle A330 A340, P/N S1820514-05, to be installed on AIRBUS A330 and A340 aircraft.

Refer to relevant document for information on transmitters, CS144, remote control panels, antennas and testing equipment.

1.2. List of acronyms

AA .... Airworthiness Authorities
AD ....Automatic Deployable
AF ....Automatic Fixed
AP .... Automatic Portable
ATC...Air Traffic Control
BFE .... Buyer Furnished Equipment
BNC .... Bayonet Nut Connector
BPS...Bits Per Second
CSN .... Cospas Sarsat Number
CS144..Cospas Sarsat 144 bits Interface Module
DDP ....Declaration of Design and Performance
DGAC ....Direction Générale de l'Aviation Civile (France)
DIN...Deutches Institut für Normung
DONGLE.. Connector Plug with Serial Memory Module
EEPROM ....Electrically Erasable Programmable Read Only Memory
ELT .... Emergency Locator Transmitter
EPIRB ....Emergency Position Indicating Radio Beacon
FAA...Federal Aviation Administration
FAR.. Federal Aviation Rules
FEE .... Fiche d'Evolution d'Equipement
FH .... Flight Hours
FMS ....Flight Management System
GEO...Geostationary Earth Orbit
GPS ....Global Positioning System
GSAC...Groupement pour la Sécurité Aviation Civile
IATA...International Air Transport Association
ICAO...International Civil Aviation Organisation
JAA .... Joint Airworthiness Authorities
JAR .... Joint Airworthiness Rules
JTSO...Joint Technical Standard Order
LEO..Low Earth Orbit
LRU.. Line Replaceable Unit
LUT .... Local User Terminal
MTBF ....Mean Time Between Failure
MTBUR .... Mean Time Between Unscheduled Removal
MSN ....Mainframe Serial Number
PLB .... Personal Locator Beacon
P/N .... Part Number
QAC ....Qualification Aviation Civile
RAM .... Random Access Memory
RCP .... Remote Control Panel
S ....Survival
SAR ....Search And Rescue
SB ....Service Bulletin

SFACT ....Service de la Formation Aéronautique et du Contrôle Technique

SMM.. Serial Memory Module

TCAS .... Traffic Collision Avoidance System

TBC.. To Be Confirmed

TBD.. To Be Determined

TSO... Technical Standard Order

XPDR ....Transponder

2. APPLICABLE DOCUMENTS

The study of older generation ELT failures has enabled a better understanding of the environmental conditions of a crash. All these environment studies resulted in the writing of new specifications for ELT by both RTCA (Radio Technical Commission for Aeronautics) and EUROCAE (EURopean Organisation for Civil Aviation Equipment).

Their work is published in RTCA DO183/204 and EUROCAE ED62 documents.

This has given birth to a new generation of ELTs. The main differences with the older generation are better mechanical characteristics, severe specifications for automatic activation and identification of the aircraft with the introduction of the " 406 MHz frequency ".

Reference	Title
RTCA DO-182	"Emergency Locator Transmitter (ELT) Equipment Installation and Performance"
RTCA DO-183	"MOPS for Emergency Locator Transmitters. Automatic Fixed, Automatic Portable, Automatic deployable, Survival Operating on 121.5 and 243.0 Megahertz"
RTCA DO-204	"MOPS 406 MHz Emergency Locator Transmitters (ELT)"
RTCA DO-160C EUROCAE ED14C	"Environmental conditions and test procedures for airborne equipment"
QAC3	Radiobalise de détresse fonctionnant en VHF (121.5-243 MHz)
QAC14	Radiobalise de détresse conforme au TSO-C91a et/ou au TSO-C126
QAC23	Radiobalise de détresse triple fréquence conforme à l'ED62
FAA TSO-C91a	"Emergency Locator Transmitter (ELT) equipment"
FAA TSO-C126	"406 MHz Emergency Locator Transmitter (ELT)"
EUROCAE ED62	"MOPS for aircraft Emergency Locator Transmitters (121,5/243 MHz and 406 MHz)"
COSPAS-SARSAT C/S T.001	"Specification for COSPAS-SARSAT 406 MHz distress beacons"
COSPAS-SARSAT C/S G.005	"COSPAS-SARSAT guidelines on 406 MHz beacon coding, registration and type approval"
COSPAS-SARSAT C/S G.004	"COSPAS-SARSAT glossary"
IATA A45	"International Air Transport Association (IATA) Dangerous Goods Regulation, section A45"

3. DESIGN FEATURE

3.1. General

3.1.1. Programming dongle

In order to facilitate maintenance operations especially in case of removal and/or standard exchange, SERPE-IESM has included in all the KANNAD 406 ELTs the capability to read an external memory (Serial Memory Module).

Instead of installing a DIN 12 connector for connection to the Remote Control Panel, a special connector with SMM is installed. This connector is called "Programming Dongle" and is also used as a connector for the remote control panel (Refer to Figure 2: ELT system description, item 5).

As the Programming Dongle is part of the harness linking the ELT to the RCP, it remains attached to the aircraft even if the ELT is removed.

When an unprogrammed ELT is installed and connected to this Programming Dongle, the identification data contained in the Programming Dongle memory is automatically loaded in the ELT memory when the ELT is switched to "ARM". The ELT keeps its identification data even if removed from the aircraft.

3.1.2. Maintenance dongle

If the removal is not due to distress purposes, this might be a problem with regards to COSPAS-SARSAT system integrity because two ELTs (ELT removed and ELT installed) will have the same identification data. To reset the identification data inside the ELT, SERPE-IESM has developed another type of Dongle called "Maintenance Dongle".

The memory of a maintenance dongle contains a specific maintenance code (country, manufacturer, serial number) recognised by COSPAS-SARSAT as "not on board". Any transmission in the shop during maintenance procedure will not alert Search And Rescue operation.

As a rule, the aircraft operator shall equip:

• each aircraft in operation with a "Programming Dongle";

• each ELT in spare with a "Maintenance Dongle".

3.1.3. Variants of programming dongle

To satisfy AIRBUS requirements, two pre-wired variants of programming dongles have been developed to be compatible with the standard wiring of AIRBUS aircraft:
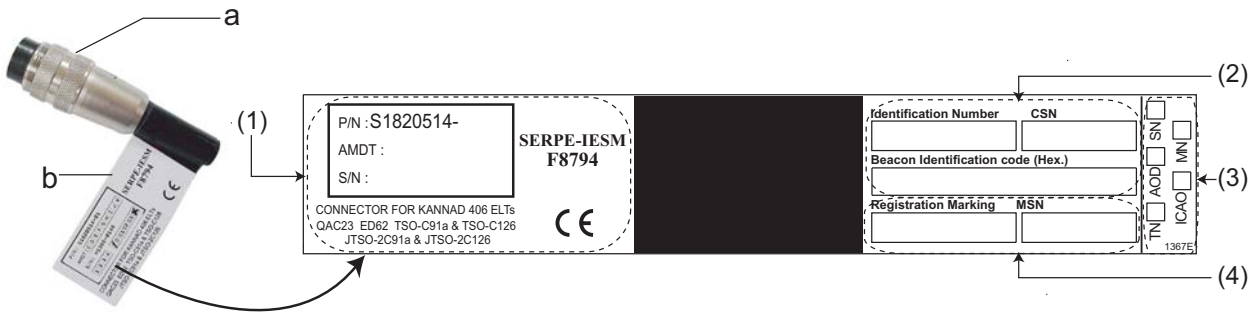
• programming dongle A320 (P/N S1820514-04);

• programming dongle A330 A340 (P/N S1820514-05).

3.2. Mechanical design

3.2.1. Programming dongle

Figure 3: Programming dongle description

The programming dongle is a DIN 12 connector (a) with a PCB fitted with a Serial Memory Module.

A name plate (b) is attached to the dongle and gives the following information:

(1) equipment (P/N and S/N) and main approvals;

(2) identification data programmed (identification number, hexadecimal transcription of beacon identification code);

(3) Type of protocol used to program identification data;

(4) Aircraft (tail number, MSN).

NOTE: Fields (2), (3) and (4) must be completed during dongle programming (Refer to Figure 9: Instructions to complete a dongle label).

3.2.2. Maintenance dongle

Figure 4: Maintenance dongle description

A Maintenance Dongle looks like a DIN 12 connector. As for the programming dongle, it is fitted with a Serial Memory Module. A red "Remove Before Flight" streamer is attached to the maintenance dongle to warn the maintenance operator not to forget to re-program the ELT with a programming dongle before flight.

3.2.3. Programming dongle A320

Figure 5: Programming dongle A320 description
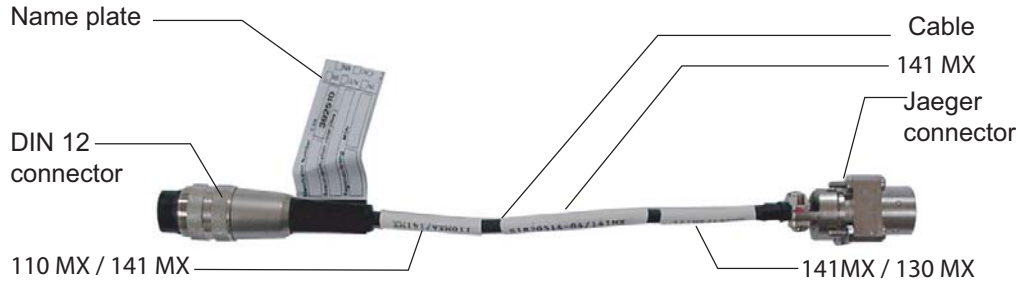
As for the programming dongle, the dongle A320 is a DIN 12 connector with a PCB fitted with a Serial Memory module. This dongle is connected to a Jaeger 19 connector.

Its name plate is identical to that of programming dongle (Refer to Figure 3: Programming dongle description) and gives the same information.

The cable linking DIN12 connector and Jaeger connector has three labels (heat-shrink marker sleeves) related to AIRBUS references:

- 141MX: cable reference;
- 110MX/141MX: DIN 12 connector termination;
- 141MX / 130MX: Jaeger19 connector termination.

3.2.4. Programming dongle A330 A340

Figure 6: Programming dongle A330 A340 description
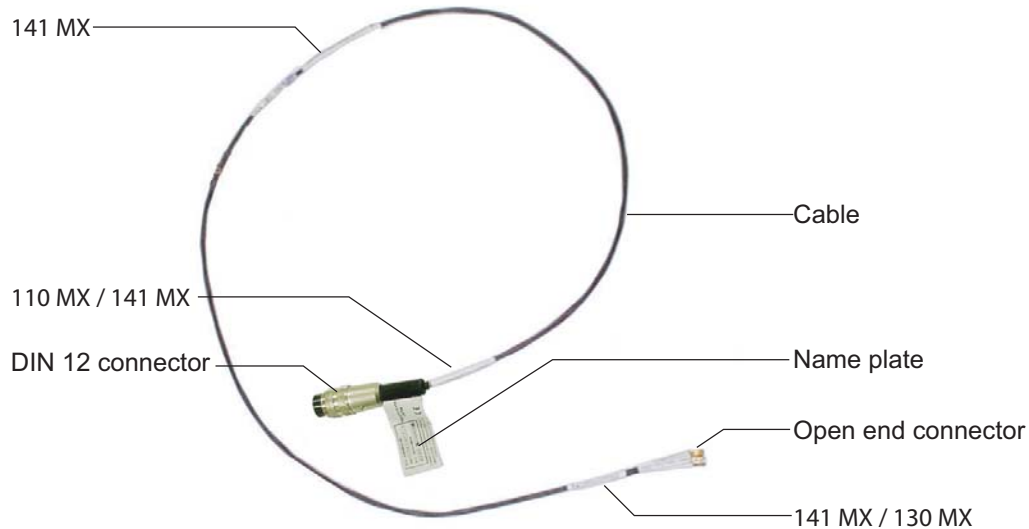
As for the programming dongle, the dongle A330 A340, the dongle is a DIN 12 connector with a PCB fitted with a Serial Memory Module. This dongle is connected to an open-end connector with five crimped male contacts.

Its name plate is identical to that of programming dongle (Refer to Figure 3: Programming dongle description) and gives the same information.

The cable linking DIN12 connector and open-end connector has three labels (heat-shrink marker sleeves) related to AIRBUS references:

- 141MX: cable reference;
- 110MX/141MX: DIN 12 connector termination;
- 141MX / 130MX: open-end connector termination.

3.3. Working principle

3.3.1. Digital message transmission

One of the major improvements of the new generation of ELTs is the transmission of the identification of the aircraft in distress in the 406 MHz digital message.

3.3.1.1. Protocols

The KANNAD 406 ELTs are fully compatible with the transmission protocols specified by the

COSPAS-SARSAT C/S G005 document :

• Serial Identification Number ("Cospas-Sarsat Number of the ELT or serial number from an allocated segment or serial number given by the local authority).

• Aircraft 24 bit address (ICAO number of the aircraft, also used for MODE S XPDR or TCAS).

• Aircraft Operator Designator + serial number up to 4096.

• Aircraft Nationality and Registration Marking also called "tail number" (up to 7 alphanumeric characters).

• Aircraft Operator Designator or Aircraft 24 bit address + aircraft position (Standard Location Protocol)*.

• Aircraft Nationality and Registration Marking + aircraft position (User Location Protocol)*.

NOTE: (*) only available if connected to an interface module (CS144) that computes the "long message".

3.3.1.2. Programming

To facilitate maintenance operations especially in case of removal and/or exchange, the KANNAD 406 ELTs offer pin-programming capabilities.

Programming an ELT with its identification number can be carried out:

• either with an interface to run a PC/DOS software (PR550);

• or with a " Dongle".

As for programming an ELT, the dongle is connected to a PC computer running a PC/DOS or Windows® software via a special computer interface. The identification is downloaded into the dongle. This operation takes less than 2 minutes and does not require any hardware operation.

Figure 7: Dongle connected to a PR550 programming equipment

Figure 8:

When an unprogrammed ELT is installed, connected to this Programming Dongle and switched to "ARM", the ELT automatically updates its own memory with the identification data contained in the Programming Dongle memory.
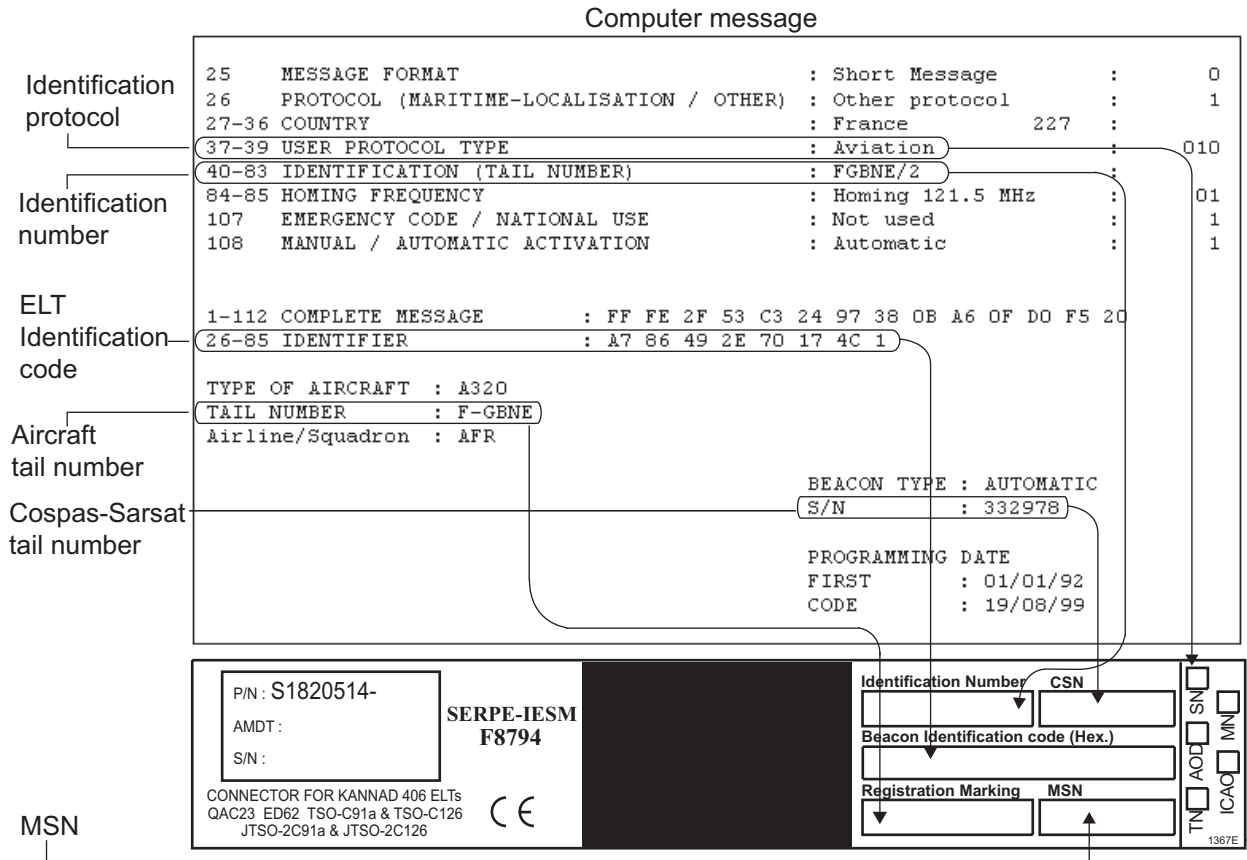
When the ELT is removed from the aircraft, it keeps its identification data

Each programming dongle has a label that shows the P/N, the manufacturer and the identification data programmed in its memory.

Thus, after dongle programming, it is necessary to complete these fields of the name plate in compliance with the computer message.

Figure 9: Instructions to complete a dongle label

Computer message

```
25    MESSAGE FORMAT                            : Short Message    :    0
26    PROTOCOL (MARITIME-LOCALISATION / OTHER) : Other protocol   :    1
27-36 COUNTRY                                   : France      227  :
37-39 USER PROTOCOL TYPE                        : Aviation         :  010
40-83 IDENTIFICATION (TAIL NUMBER)              : FGBNE/2          :
84-85 HOMING FREQUENCY                          : Homing 121.5 MHz :   01
107   EMERGENCY CODE / NATIONAL USE             : Not used         :    1
108   MANUAL / AUTOMATIC ACTIVATION             : Automatic        :    1


1-112 COMPLETE MESSAGE        : FF FE 2F 53 C3 24 97 38 0B A6 0F D0 F5 20
26-85 IDENTIFIER              : A7 86 49 2E 70 17 4C 1

TYPE OF AIRCRAFT : A320
TAIL NUMBER      : F-GBNE
Airline/Squadron : AFR

                                          BEACON TYPE : AUTOMATIC
                                          S/N         : 332978

                                          PROGRAMMING DATE
                                          FIRST       : 01/01/92
                                          CODE        : 19/08/99
```

Identification protocol

Identification number

ELT Identification code

Aircraft tail number

Cospas-Sarsat tail number

MSN

P/N : S1820514-
AMDT :
S/N :

SERPE-IESM
F8794

CONNECTOR FOR KANNAD 406 ELTs
QAC23 ED62 TSO-C91a & TSO-C126
JTSO-2C91a & JTSO-2C126 CE

Identification Number   CSN

Beacon Identification code (Hex.)

Registration Marking   MSN

SN MN AOD ICAO TN

1367E

- Identification protocol: put a cross in the box related to the protocol used (ICAO for SERIALIZED programming or TN for AVIATION programming).

- Identification number: complete this field with either the tail number, the 24 bit address, the aircraft operator designator or serial number in relation to the protocol used.

- CSN: Cospas-Sarsat number.

- ELT Identification code (HEX): complete this field with the 15 hexadecimal digits (computed by the programming software).

- Aircraft Tail Number: complete this field in relation to the aircraft where the ELT is to be installed.

- MSN: can be completed by the aircraft manufacturer (not mandatory).

3.3.1.3. Reliability of the "pin-programming" function

Figure 10: Memory organisation
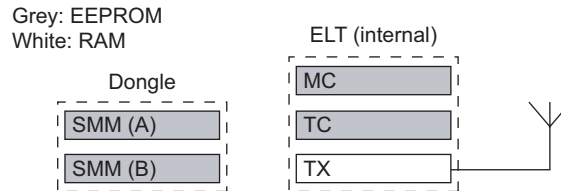
The "pin-programming" and "long message" capabilities have been developed at the same time as the ELT. This means that several safeguards have been anticipated to ensure that the ID code transmitted is correct even in extreme condition should the Dongle be damaged during data transfer.

One of the safeguards concerns the internal memory organisation:

• MC: EEPROM that contains the maintenance code ("SI" + 5 last digits of the CSN),

• TC: EEPROM that contains the code to be transmitted,

• TX: RAM that contains the code transmitted once the ELT is activated.

The SMM is also duplicated into two segments with a checksum to verify integrity of the data transferred:

• SMM (A);

• SMM (B).

Once activated, TC is copied into TX and the ELT detects if a programming and testing equipment is connected.

• If no programming and testing equipment is detected, the beacon tries to read a Serial Memory Module by testing the synchronous serial link.

• If a Maintenance Dongle is detected, the contents of MC is copied into TC and into TX.

• If a Programming Dongle is detected, its contents is copied into TC and into TX.

• If a "long message" interface module is detected, its contents is copied into TX.

The above procedure is performed during self-test and during 20 minutes after activation of the ELT.

Optional CS144 (Refer to Figure 2: ELT system description, item 6)

The other safeguard consists in duplicating the Dongle and CS144 interface module memory and to compute two checksums. This point is all the more interesting for the CS144 option, as, should the power supply of the CS144 interface module be shut down during data transfer, the older message containing the aircraft position just before shut down will be available.

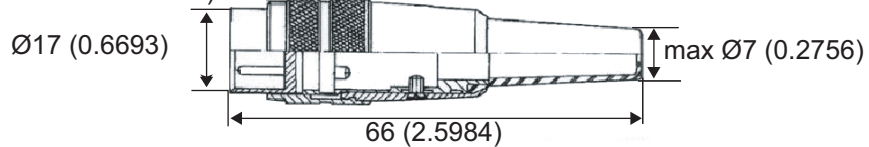Figure 11: long message transfer
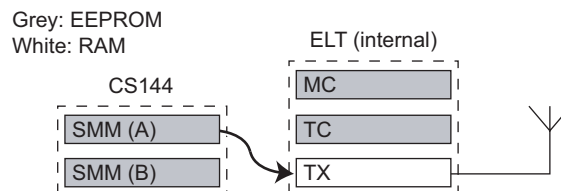
4. TECHNICAL CHARACTERISTICS

4.1. Mechanical characteristics

4.1.1. Overall dimensions

Figure 12: Programming & Maintenance dongle, overall dimensions

Note : all dimensions are in millimeter
(inches in brackets)

Ø17 (0.6693)   max Ø7 (0.2756)

66 (2.5984)

NOTE: with label
- programming dongle 60 x 17 x 66 mm (2.362 x 0.669 x 2.598 in.).
- maintenance dongle 250 x 17 x 66 mm (9.84 x 0.669 x 2.598 in.).

Figure 13: Dongle A320, overall dimensions

Note : all dimensions are in millimeters
(inches in brackets)

220 ± 5 (8.66 ± 0.197)

Ø17 (0.6693)

110MXA   110MXA/141MX   141MX   141MXA/130MX   130MX

66 (2.5984)
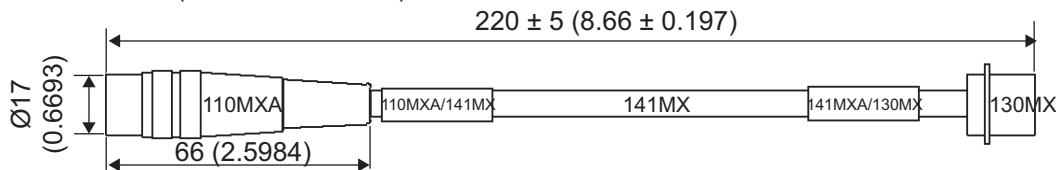
Figure 14: Dongle A330 A340, overall dimensions

Note : all dimensions are in millimeters
(inches in brackets)

900 ± 5 (35.433 ± 0.197)

Ø17 (0.6693)

110MXA   110MXA/141MX   141MX   141MXA/6233VT

66 (2.5984)
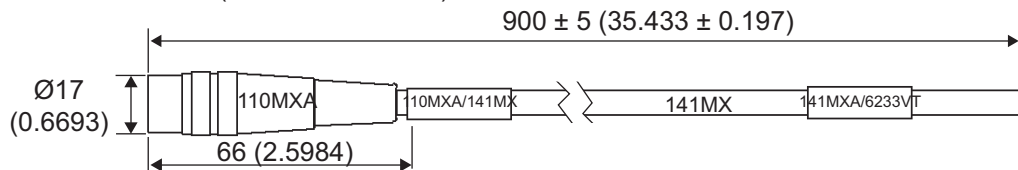
4.1.2. Weight

Programming dongle	Maintenance dongle	Dongle A320	Dongle A330 340
20 gr. (0.044 lbs)	30 gr. (0.066 lbs)	46 gr. (0.101 lbs)	42 gr. (0.092 lbs)

4.1.3. Connectors

DIN 12 connectors (all dongles)	
Type	DIN (specification DIN 45321)
Number of contacts	12 male
Type of contacts	soldered
Supplier reference	BINDER 680-1-09-0329-00-12

Jaeger connector (dongle A320)	
Type	Jaeger
Number of contacts	19 female
Type of contacts	crimped
Supplier reference	Connector: 761 219 006 Backshell: 533 349 006 Cable clamp: 530 371 006

Open-end connector (dongle A330 A340)	
Type	open end with crimped male contacts
Number of contacts	5
Type of contacts	crimped (NAS937910EA2000)
Supplier reference	DEUTSCH 02000820

4.2. Electrical performances

Memory module	
Type	Serial EEPROM
Reference	S93C66
Supplier	SEIKO

4.3. Environmental characteristics

Environmental	
Magnetic effect	DO160D / ED14D Section 15 Category Z
Vibrations	DO160D / ED14D Section 8 Category U
Operating temperature	-40°C to +85°C (memory)
Storage temperature	-65°C to +150°C (memory)
ESD protection	4 kV

4.4. Reliability

Reliability	
MTBF (PCB only) according to MIL HDBK-217F	34 111 211 hours
Data retention (memory)	10 years
E/W cycles	1 000 000

5. INTERFACES

5.1. Electrical interfaces

The dongles are standalone systems i.e. there is no connection with the aircraft power buses.

5.1.1. Programming dongle

The programming dongle (P/N S1820514-01) is composed of a DIN12 connector fitted with a PCB. The PCB is soldered directly to the connector.

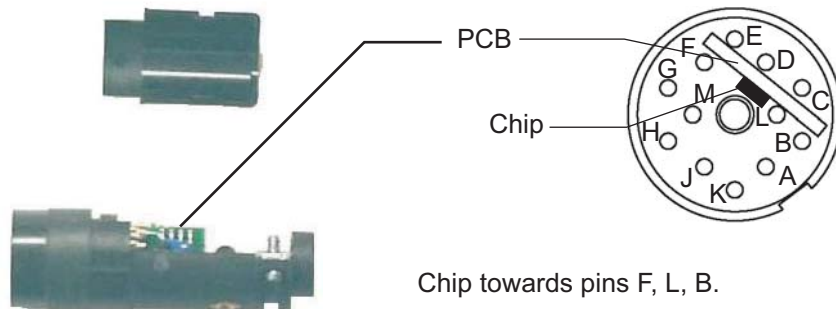Figure 15: J1 Dongle connector description

Chip towards pins F, L, B.

Table 1: Programming dongle pin-out

J1	PIN	Signal Name	Destination	Direction
Viewed from back face of inserts	J1-A	RCP TEST/RESET	RCP	IN
	J1-B	DONGLE RX	SMM / PGM	OUT
	J1-C	DONGLE CS	SMM	IN
	J1-D	DONGLE SK	SMM	IN
	J1-E	DONGLE TX	SMM / PGM	IN
	J1-F	DONGLE ALE2P	SMM	IN
	J1-G	RCP COMMON	RCP	OUT
	J1-H	RCP BUZZER	RCP(*)	OUT
	J1-J	RCP LED	RCP	OUT
PCB soldered to pins B, C, D, E, F, L.	J1-K	RCP ON	RCP	IN
	J1-M	DONGLE GND	SMM / PGM	OUT
	J1-M	N/C		

Contacts that are not used for SMM connection are used to connect the ELT to the RCP.

RCP : Remote Control Panel

SMM : Serial Memory Module (Dongle or GPS interface)

PGM : programming and testing equipment

N/C : not connected

(*) This wire is not used with some versions of Remote Control Panels. For precise information, refer to Remote Control Panel technical description.
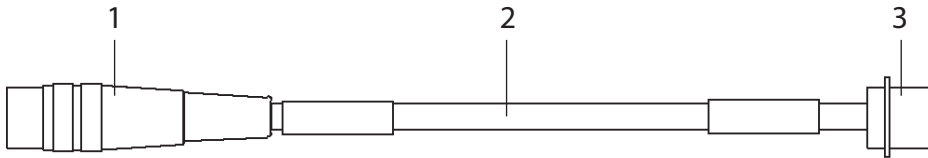
5.1.2. Programming dongle A320

The programming dongle A320 (P/N S1820514-04) is composed as follows:

(1) J1: Programming dongle (Refer to 5.1.1. Programming dongle).

(2) Four wires bundle cable in compliance with AIRBUS standard.

(3) J2: Jaeger 19 Pts female connector.

Figure 16: Programming Dongle A320 connectors and cable

The Jaeger 19 Pts female connector is the end connector of the programming dongle A320. It is dedicated for connection to the Remote Control Panel

This connector can be fixed onto a mounting plate (Refer to 6.1.2. Programming dongle A320 connection).

It is composed as follows:

(1) a connector;

(2) a backshell;

(3) a clamp;

(4) four screws;

(5) four nuts.

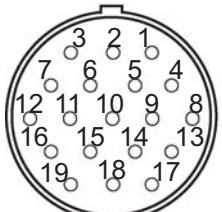Figure 17: Jaeger connector (J2) description
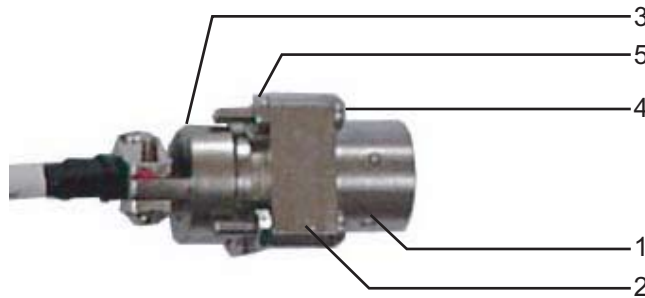
Receptacle			
Part	**Supplier**	**Designation - P/N**	**Remarks**
Connector 19 Pts female	Jaeger	761 219 006	High density miniature connector Push-pull locking
Backshell	Jaeger	533 349 00	
Cable clamp	Jaeger	530 371 006	

Table 2: Jaeger connector (J2) pin-out

J2	PIN	Signal Name	Destination	Direction
J2 view from RCP side RCP SIDE	J2-1	N/C		
	J2-2	N/C		
	J2-3	N/C		
	J2-4	N/C		
	J2-5	N/C		
	J2-6	N/C		
	J2-7	RCP COMMON	RCP	OUT
	J2-8	RCP RESET / TEST	RCP	IN
	J2-9	RCP ON	RCP	IN
	J2-10	N/C		
	J2-11	N/C		
	J2-12	N/C		
	J2-13	N/C		
	J2-14	N/C		
	J2-15	RCP BUZZER	RCP(*)	OUT
	J2-16	N/C		
	J2-17	N/C		
	18	N/C		
	J2-19	RCP LED	RCP	OUT

RCP : Remote Control Panel

N/C : not connected

(*) This wire is not used with some versions of Remote Control Panels. For precise information, refer to Remote Control Panel technical description.
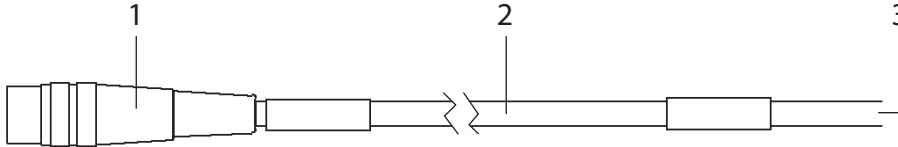
5.1.3. Programming dongle A330 A340

The programming dongle A330 A340 (P/N S1820514-05) is composed as follows:

(1) J1: Programming dongle (Refer to 5.1.1. Programming dongle).

(2) Four wires bundle cable in compliance with AIRBUS standard.

(3) J2: 5 male contact DEUTSCH open-end connector.

Figure 18: Programming Dongle A330 A340 connectors and cable

Open end connector			
Part	**Supplier**	**Designation - P/N**	**Remarks**
5 crimped male contacts	Deutsch	DEUTSCH 02000820	crimped contacts (NAS937910EA2000)

Table 3: DEUTSCH open end connector (J2) pin-out

J2	**PIN**	**Signal Name**	**Destination**	**Direction**
	2565-5551	RCP BUZZER	RCP(*)	OUT
	2565-5552	RCP LED	RCP	OUT
	2565-5553	RCP RESET / TEST	RCP	IN
	2565-5554	RCP ON	RCP	IN
	2565-5555	RCP COMMON	RCP	OUT

RCP : Remote Control Panel

N/C : not connected

(*) This wire is not used with some versions of Remote Control Panels. For precise information, refer to Remote Control Panel technical description.

6. INSTALLATION AND ACCEPTANCE TEST PROCEDURE
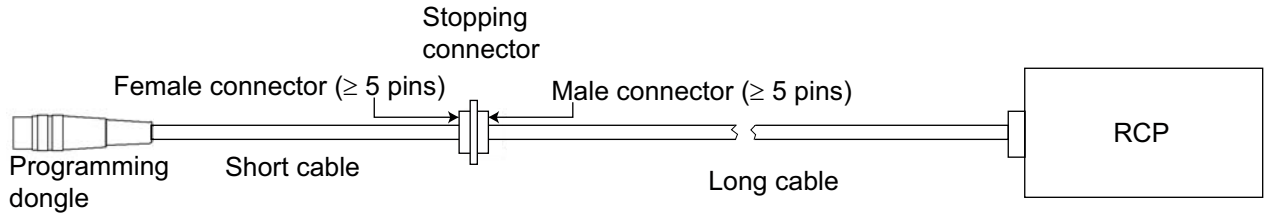
6.1. Installation

6.1.1. Programming dongle connection

The programming dongle, P/N S1820514-01, is supplied without connection cable.

To connect the programming dongle to a RCP, a connection cable has to be made.

CAUTION: in order to easily remove the programming dongle when connected, it is necessary to fit its cable with a stopping connector as close as possible to it (see figure below).

Figure 19: Dongle to RCP connection cable

- Make a 5 wire bundle (AWG24, shielded preferred) long enough to reach between the ELT installation location and the cockpit panel RCP location.
- Cut it to obtain a short cable.
- Solder the dongle to one end of short cable.

CAUTION: when soldering the wires onto the pins of the dongle, take great care not to warm the PCB (this can damage the memory). Put heat-shrinkables sleeves to protect the pins.

- Solder a female connector (minimum 5 pins) to the other end of short cable, according to programming dongle pin-out (Refer to Table 1: Programming dongle pin-out).
- To one end of the long cable connect a male connector (mating connector of that specified above).
- Solder the other end of the long cable to the RCP mating connector or directly to RCP (Refer to Table 1: Programming dongle pin-out and to RCP relevant document).

6.1.2. Programming dongle A320 connection

The programming dongle A320, P/N S1820514-04, is supplied with its connection cable compliant with AIRBUS standard. No supplementary connection cable have to be made. The second connector (Jaeger 19 pins female) can be fixed onto a mounting plate.

Figure 20: Drilling mask for Jaeger connector
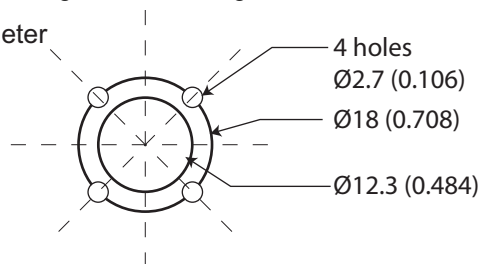
For connection to RCP refer to AIRBUS procedures.

6.1.3. Programming dongle A330 A340

The programming dongle A330 A340, P/N S1820514-05, is supplied with its connection cable compliant with AIRBUS standard. No supplementary connection cable have to be made. The open end connector has to be soldered to the RCP mating connector or directly to RCP (Refer to Table 1: Programming dongle pin-out, Refer to Table 3: DEUTSCH open end connector (J2) pin-out and to RCP relevant document).

6.2. Acceptance Test Procedure

Perform the following test:

(1) ELT operational tests,

(2) RCP operational tests,

6.2.1. ELT operational test

NOTE: if a programmed ELT is re-programmed with a new programming dongle, the self-test cannot indicate if the ELT transmits the old or the new identification data. That why it is important to check that the ELT is not programmed and, eventually, to de-programme the ELT before installing the programming dongle.

- Connect the outside antenna to J2 of ELT;

- Switch the ELT from OFF to ARM;

- Check that the Self-Test fails (3+4 flashes).

- If not, connect a maintenance dongle to J1 of ELT:

  - Switch the ELT from OFF to ARM;

  - Check that the Self-Test fails (3+4 flashes);

  - Remove the maintenance dongle from J1.

- Connect the "Programming Dongle" to J1of ELT;

- Switch the ELT from OFF to ARM:
  the buzzer operates during the whole self-test procedure, after a few seconds the LED displays the result.

- Check that the Self-Test result is OK (one long flash).

6.2.2. RCP operational test

Check correct operation of RCP LED and external buzzer by switching ELT and RCP as described in the sequential procedure hereunder (with ELT switch in position "ARM").

Table 4: RCP LED and buzzer operation

Sequence	RCP Switch	Result
1	TEST/RESET then back to ARMED (neutral)	Self-test: ELT and RCP LEDs flashing + uninterrupted buzzer activation (max. duration 5 seconds).
2	ON	ELT transmission: ELT and RCP LEDs flashing + uninterrupted buzzer activation. **IMPORTANT:do not operate for more than 50 seconds.**
3	ARMED (neutral)	ELT transmission goes on.
4	TEST/RESET then back to ARMED (neutral)	ELT transmission stops.

7. COMPATIBILITY

7.1. Compatibility list

ELT		
KANNAD 406 ATP	S1819502-02	SERPE-IESM
KANNAD 406 ATP-M	S1818502-02	SERPE-IESM
KANNAD 406 AP	S1820502-02	SERPE-IESM
KANNAD 406 AF	S1821502-02	SERPE-IESM
KANNAD 406 AF (6D)	S1821502-06	SERPE-IESM
KANNAD 406 AS (BNC)	S1823502-02	SERPE-IESM
KANNAD 406 AS (TNC)	S1823502-03	SERPE-IESM
KANNAD 121 AF	S1824502-02	SERPE-IESM
KANNAD 121 AF-H	S1826502-02	SERPE-IESM

Remote control panels	P/N	Supplier
RC100 (Kit)	S1820513-03	SERPE-IESM
RC110 (Kit)	S1820513-06	SERPE-IESM
RC150 (Kit)	S1820513-07	SERPE-IESM
RC160 (Kit)	S1820513-08	SERPE-IESM
RC200	S1820513-11	SERPE-IESM
RC200-NVG	S1820513-14	SERPE-IESM
RC300	S1820513-09	SERPE-IESM
RC300-NVG	S1820513-10	SERPE-IESM
RC400	S1820513-05	SERPE-IESM
RC500-320	S1820513-02	SERPE-IESM
RC600-NVG (Y)	S1820513-12	SERPE-IESM
RC600-NVG (W)	S1820513-13	SERPE-IESM

Interface modules for long message	P/N	Supplier
CS144-RS	S1825501-01	SERPE-IESM
CS144-A	S1825501-02	SERPE-IESM

Programming and testing equipment	P/N	Supplier
PR550	S7025501	SERPE-IESM
COSPAS-SARSAT DECODER	ARG 5410	SARTECH

7.2. Evolutions

Type	P/N	Amdt	Description of modification
Programming Dongle	S1820514-01	A	First issue
		B	Add of 100 nF decoupling capacitor
		C	Memory replaced by S93C66 SEIKO memory
Maintenance Dongle	S1820514-02	A	First issue
		B	Add of 100 nF decoupling capacitor
		C	Memory replaced by S93C66 SEIKO memory
Dongle A320	S1820514-04	A	First issue
		B	Add of 100 nF decoupling capacitor
		C	Memory replaced by S93C66 SEIKO memory
Dongle A330 A340	S1820514-05	A	First issue
		B	Add of 100 nF decoupling capacitor
		C	Memory replaced by S93C66 SEIKO memory

8. QUALIFICATION

8.1. Approvals

Airworthiness approval was granted by DGAC (French notified Airworthiness Authorities) which is also the notified body for evolutions on previously approved equipment.

Application for recognition of the French approval in other countries is under way. In particular, TSO-C91a / TSO-C126 and JTSO-2C91a / JTSO-2C126 have been granted enabling installation on board any aircraft whatever its country of registration.

8.2. Test reports

The table hereunder gives references to the test reports carried out with the dongles.

Index	Laboratory	Date	Ref.	Title
AG	SERPE-IESM	06/11/00	DPW006	Essais de qualifications de dongles AIRBUS

8.3. Qualification tests

ENVIRONMENTAL CONDITIONS	DO 183	DO 204	ED62	DO160C	Test Report Index
Vibration				§ 8	AG
Magnetic effect				§ 15	AG

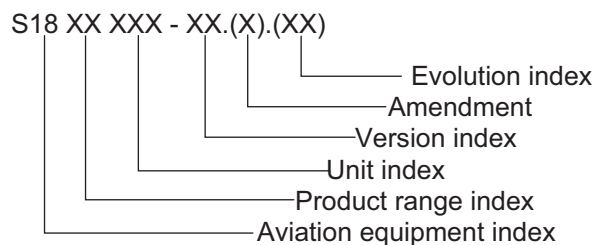## 9. MANUFACTURING

9.1. Quality insurance

All aviation equipment manufactured by SERPE-IESM are covered by the JAR21-Sub part G Production Agreement number F.G.132 delivered by the French Civil Aviation Authority. It is GSAC's responsibility to control periodically compliance of the production process with Production Agreement Specifications.

The Quality Control integrity of the equipment is attested by the issuance of the Certificate of Airworthiness for export (JAA Form 1).

9.2. P/N structure

All series equipment are described in the production management system by an assembly number including sub-assemblies or components.

The assembly numbers are designated as follows:

S18 XX XXX - XX.(X).(XX)

```
                        Evolution index
                      Amendment
                    Version index
                  Unit index
                Product range index
              Aviation equipment index
```

The "Part Number" (P/N) corresponds to the first 10 digits of the assembly number.

S18 XX XXX - XX

In case of equipment evolution, if "Form Fit Function" is altered, the Version index is modified.

If not, either Amendment or evolution index will be increased depending on the level of demonstration required by the Airworthiness Authority to validate the modification.

As a consequence, all series equipment having the same Part Number are fully interchangeable.

9.3. Marking

9.3.1. Name plate

This name plate, available for all dongles described in this manual, is stuck at the rear part of the DIN12 connector. It gives information on:

(1) Part Number (P/N);

(2) Amendment (AMDT);

(3) Serial Number (S/N);

(4) Qualification Certificates (references of);

(5) Manufacturer name;

(6) Manufacturer code;

(7) CE marking;

(8) Identification date programmed (identification number, hexadecimal transcription of beacon identification code);

(9) Type of protocol used to program identification data;

(10)Aircraft tail number.

Figure 21: Name plate and programming markings

9.3.2. Red streamer

This red label, attached to the maintenance dongle P/N S1820514-02, shows a "REMOVE BEFORE FLIGHT" information on one face, the manufacturer trademark on the other face.

Figure 22: Red streamer

9.4. Programming

The dongles are programmed in our factory:

- with a maintenance code if the distributor or the aircraft operator is equipped with programming equipment. Once installed the "Programming Data Sheet" shall be returned duly completed to SERPE-IESM responsible for keeping its database up-to-date.

- with the aircraft identification data if neither the distributor nor the operator are equipped with programming equipment. In this case, the order must be sent with the "Programming Data Sheet" duly completed.

In any case, the operator is responsible for registration with the "COSPAS-SARSAT point of contact for 406 Mhz beacon registration matters". The list is available upon request.

10. MAINTENANCE POLICY

Because of the extreme reliability of this equipment, corrective maintenance will be limited to a replacement.

For preventive maintenance and parts list, refer to:

ACMM 25-63-40 for programming dongle ,P/N S1820514-01;

ACMM 25-63-41 for Dongle A320, P/N S1820514-04;

ACMM 25-63-42 for dongle A330 A340, P/N S1820514-05.

11. RELATED DOCUMENTATION

11.1. Files

Document	Reference	Distribution
Declaration of Design and Performance Programming dongle Dongle A320 Dongle A330 A340	DOC99168 DOC00232 DOC00233	ATTACHED ATTACHED ATTACHED
Definition file	N/R	N/A
Production file	DOC99062	INTERNAL ONLY
Production Agreement Specifications (MOP)	DOC00025	INTERNAL & GSAC
Installation Manual / Operation Manual / Inspection Log	N/A	N/A
Abbreviated Component Maintenance Manual with Illustrated Parts List Programming dongle Dongle A320 Dongle A330 A340	ACMM 25-63-40 ACMM 25-63-41 ACMM 25-63-42	WITH MAINTENANCE TRAINING
Programming data sheet	DIM00300	ON REQUEST
Sales leaflet	N/A	N/A

11.2. Drawings

Document	Reference	Distribution
DIN 45321-12 plug	S18 20 4 15	ON REQUEST
Plug 09-0329-00-12	S18 21 4 15	ATTACHED
Wiring diagram	S18 19 4 45	ATTACHED
Markings: nameplate	010 11 3 67	ON REQUEST
Markings: red streamer	010 11 3 38	ON REQUEST
Programming dongle A320	OCAM S182051404	ATTACHED
Programming dongle A330 A340	OCAM S182051405	ATTACHED

11.3. Qualification certificates

Document	Reference	Distribution
Production Agreement certificates (JAR 21G)	DOC00025	ON REQUEST