EUROCAE WG-98 Plenary # 10/ RTCA SC-229 Plenary # 9- Meeting Minutes
“Aircraft Emergency Locator Transmitters (ELTs)”

<table>
<thead>
<tr>
<th>Date</th>
<th>Tuesday 13th through Friday 16th December 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place</td>
<td>Fort Lauderdale, U.S.A.</td>
</tr>
<tr>
<td>Venue</td>
<td>Riverside Hotel–620 Las Olas Boulevard, Fort Lauderdale –U.S.A.</td>
</tr>
<tr>
<td>Hosted</td>
<td>ACR Electronics Inc. 5757 Ravenswood Road, Fort Lauderdale, FL 33312, U.S.A.</td>
</tr>
</tbody>
</table>

Present:

<table>
<thead>
<tr>
<th>Name</th>
<th>1st name</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anderson</td>
<td>Richard</td>
<td>Boeing Commercial Airplanes</td>
</tr>
<tr>
<td>Audouze</td>
<td>Xavier</td>
<td>EASA</td>
</tr>
<tr>
<td>Bekanich</td>
<td>Joseph</td>
<td>InFlightLabs</td>
</tr>
<tr>
<td>Bouhet</td>
<td>Alain</td>
<td>McMurdo</td>
</tr>
<tr>
<td>Cresp</td>
<td>Claude</td>
<td>ELTA</td>
</tr>
<tr>
<td>Densmore</td>
<td>Jeff</td>
<td>Radiant Power Corp.</td>
</tr>
<tr>
<td>Feith</td>
<td>Greg</td>
<td>InFlightLabs</td>
</tr>
<tr>
<td>Fisher</td>
<td>John</td>
<td>FAA</td>
</tr>
<tr>
<td>Fuhrmann</td>
<td>David</td>
<td>Air Force RCC</td>
</tr>
<tr>
<td>Foster</td>
<td>Anthony</td>
<td>NASA</td>
</tr>
<tr>
<td>Green</td>
<td>Charisse</td>
<td>FAA</td>
</tr>
<tr>
<td>Hoffman</td>
<td>Chris</td>
<td>ACR Electronics, Inc.</td>
</tr>
<tr>
<td>Honot</td>
<td>Christophe</td>
<td>Airbus</td>
</tr>
<tr>
<td>Khalil</td>
<td>Fadl</td>
<td>The Boeing company</td>
</tr>
<tr>
<td>Lemon</td>
<td>Dan</td>
<td>NOAA</td>
</tr>
<tr>
<td>McCurry</td>
<td>Chris</td>
<td>Radiant Power Corp.</td>
</tr>
<tr>
<td>Morrison</td>
<td>Rebecca</td>
<td>RTCA</td>
</tr>
<tr>
<td>Ortenzio</td>
<td>Aaron</td>
<td>U.S. CoastGuard</td>
</tr>
<tr>
<td>Pack</td>
<td>Tom</td>
<td>ACR Electronics, Inc.</td>
</tr>
<tr>
<td>Plantin de Hugues</td>
<td>Philippe</td>
<td>BEA</td>
</tr>
<tr>
<td>Politis</td>
<td>Elias</td>
<td>NRC</td>
</tr>
<tr>
<td>Reich</td>
<td>Jesse</td>
<td>NOAA</td>
</tr>
</tbody>
</table>
Day 1 – Tuesday 13th December (9 am – 5 pm)

1. Welcome/Introductions/Administrative Remarks

Tom welcomed everyone to USA the RTCA SC-229 and EUROCAE WG-98 meetings.

He introduced Charisse who announced that In accordance with the Federal Advisory Committee Act, the Advisory Committee meeting is open to the public. Notice of the meeting was published in the Federal Register on: 24th October 2016 and that attendance is open to the interested public.

Full Document can be found on the webspace [INTRO_DFO_Slides_12_13_16.pdf]

Rebecca gave a statement for RTCA policies regarding proprietary references and patentable technology and copyright material required to comply with RTCA. Members were asked to review the policy from the onscreen presentation.

Full Document can be found on the webspace [Proprietary Ref Policy-2015 FINAL.pdf]

Rebecca asked everyone to sign the register and to agree to abide with RTCA policy

Questions - No questions.

Tom discussed logistics and asked for round table introductions
2. **Agenda overview and approval**

Tom reviewed the agenda from the onscreen presentation:

**Day 1**

- Welcome/Introductions/Administrative Remarks
- FAA, DFO and EUROCAE
- Agenda Overview and approval
- Minutes Lorient Joint Meeting #8 meeting review and approval
- Review Action Items from Lorient Joint Meeting #8 Meeting
- Briefing of ICAO, COSPAS-SARSAT
  - ICAO GADSS-AG activities: Mike Barton
  - Cospas-Sarsat Update on last week Council Meeting, MESOSAR Updates, T.018 Update, ELT(DT) Update: Dany St Pierre,
  - Update on T.021 plan: Tony
  - Cospas-Sarsat T-ELT Correspondence Working Group: Chris Hoffman
  - SC-225 Updates on Lithium Batteries: Jeff Densmore
- Other Industry coordination and presentations
  - White paper RLS: Pauline Martin, Thalès

**Discussions**

**Day 2**

- Working Groups meetings

**Day 3**

- Morning
  - Working Groups Meetings

- Afternoon
  - WG Status Reports
  - Action item review
  - Future meeting plans and dates (Review of June 2017 JM#11 dates)
  - Industry coordination and presentations (if any)
  - Other Business

**Day 4**

- Morning
  - Visit of the site and interactive presentations of ACR Electronics Inc.

**Questions -**

Tony asked for clarification if it was the intention to stay as a plenary or continue as two working groups as discussed during the last meeting. Tom announced that it was intended to split into two groups for this meeting and continue as a plenary for future meetings as the work of the two groups looking at specific parts of the specification needs to be completed first.
3. **Lorient meeting Minuets review and approval**

Stuart gave an update of the minutes produced from the Lorient meeting and stated that they were currently posted in draft form on the web space. Stuart asked Greg if he was happy with the part relevant to him.

Greg suggested some minor typing corrections which were amended.

Tom considered the Minutes to be approved.

4. **Review Action Items from Paris meeting**

Tom reviewed the action items and their status. Most of the actions were to be discussed during the week and it was agreed to review open actions on the final day.

5. **COSPAS-SARSAT UPDATE ON LAST WEB COUNCIL MEETING, MESOSAR UPDATES**

Dany provided an overview of the work carried out in 2016 looking at the development of the MEOSAR System, the development of the future Second Generation beacons and the development of an ELT-DT capability (triggered-in-flight ELTs).

Dany also discussed news from the JC that would affect the WG and discussed the revised timeline and various task groups that have been set up.

Dany also gave an overview of what can be expected in 2017.

6. **Other Industry coordination and presentations**

**White paper RLS: Pauline Martin, Thalès**

Pauline Martin from Thales/Alenia Aerospace gave a presentation regarding a white paper they have produced for the ICAO Recommendation. She prepared the paper following the last meeting in Lorient to answer the questions from the last meetings.

White Paper can be found on the workspace [White paper Galileo Return Link Service_V9.pdf]

**Questions**

Tom – if the beacon can be activated it means the GNSS has to be on. How do you implement this in the demo? She recommends that it is a second GNSS receiver in the beacon with Antenna which is on all the time the beacon is armed.

Fadl asked if the power comes from the battery of the ELT or a different source. She said that they recommend that it is powered by battery and aircraft supply.

Chris asked who is responsible for turning the beacon off, i.e. maintenance crew or pilot etc. Pauline confirmed that the pilot will switch to arm and off as and when applicable. Pauline then confirmed that this would be automatic. Xavier sees issues regarding power but also the criteria to arm function that we need to look at for distress tracking.

Xavier asked how they will know the ID of the aircraft. Pauline confirmed that the ELT will have to be registered and this will be a new service.

Dany said that the T-ELT group have just started work and have held to telecom meetings so far. Chris said that the group was being chaired by Fabio but Mike Reese has taken over from Canada. He said they are trying to progress and focus on operation
documents on Cospas-Sarsat but also alot of work required to test the standards. Chris said if anyone is interested they should join the group.

**SC-225 Updates on Lithium Batteries**

Jeff Densmore gave an update to SC-235 discussing the Scope, Deliverables and due dates and latest news. The new document is due for release in June.

**IN-FLIGHT LABS PRESENTATION**

Greg Feith demonstrated a video providing an update into their Smart ELT and how they can remotely trigger an ELT from ground and that they have added remote triggering and been able to program parameters into their box. The video demonstrated the updates they have carried out adding capabilities.

**Questions**

How many parameters? They can set any that are defined, i.e. single engine at 60 degree banks etc.

George- are all the ground links are through iridium? Is it autonomous? Is there a type approved ELT in the box. No it will be used with any ELT, Autonomous and through Iridium.

7. **WG 2 to 5 Status and weeks plan**

Tom discussed that the aim for the week would be to split into two groups, the first group looking at chapter 1, completing their work.

Group 2 which Philippe was leading in Lorient would continue from 4.2.3 where they finished last time.

The group adjourned for the day.

**Day 2 – Wednesday 14th December (9:00 AM – 5 PM)**

Plenary convened first thing as Rebecca wanted to explain that there is an issue with the scheduled June meeting as RTCA have their annual symposium, Other dates were discussed and it was agreed that these could be confirmed on day 3.

WG Meetings Convened for the rest of the day.

**Day 3 – Thursday 15th December (9:00 AM – 5 PM)**

Plenary session reconvened with Alain’s presentation on HELIOS looking at the work they have achieved into Fast moving ELT using 406 MHz by a modified ELT to transmit a burst within 5 seconds after activation, to have a shorter repetition period and to update the encoded location at every burst.

Full presentation can be found on the webspace [HELIOS - Fast Moving testing - Eurocae-RTCA Meeting - Dec 2016.pdf](HELIOS - Fast Moving testing - Eurocae-RTCA Meeting - Dec 2016.pdf)

Questions – Xavier Asked if they have plans to carry out this test at higher speed in an aircraft. Alain discussed the constraints that they have in getting approvals to carry out such testing on a larger aircraft.
There were discussions about location accuracy for a ELT-DT and is there a need for an accuracy specification? Cospas-Sarsat have asked ICAO and there is a whole range of accuracies. Philippe said that it should have the same accuracy as a standard ELT.

**ARINC**

Philippe discussed the white paper that he prepared at the last meeting and the feedback they have received back from ARINC.

He announced that the next SAI Subcommittee meeting will be held February 14-16, 2017 in Coral Gables, Florida. This would be the desired venue for presentation and discussion of second generation ELT. Presentation to the SAI Subcommittee via web conference / phone call is certainly possible.

Philippe said that he hasn’t answered them but was going to ask if Tom could attend with him joining through Webex and to explain why we have made this request so they will have all of the information to create their working group.

Chris asked how long the ARINC process would take. Elias said that there will be a public announcement to call for participation and they get discussed then but timelines will vary depending on complexity.

Greg said there are two things that we need to figure out. If we use ARINC and secondly we need to look at others. That could be something else and it’s for ELT manufacturers to review if they need something else.

[Action Philippe to send the white paper to the group to see if it can be improved over webexto generate some discussion]

8. **RTCA FRAC PRESENTATION**

Rebecca gave a presentation on how the FRAC process works, and the steps involved, timeline discussing our FRAC plenary on 9/7/2017 to PMC in March 2018.

The FRAC presentation has now been posted on the webspace [SC-229 - FRAC Process.pdf]

Rebecca also apologised for the error in the calling notice stating that this meeting was being held at Washington. Rebecca set up a meeting room at RTCA Headquarters but it wasn’t used as members were aware that the meeting was held in Florida.

9. **WGS’ REPORTS**

Philippe gave an update from the 2nd working group continuing to work on chapters 6 and 7. They didn’t remove anything from the document but still have proposals highlighted for the two chapters. They only have a couple of issues that require complete discussion with the group. Philippe took the actions to remove all of the ‘shall’ to replace with ‘should’. He said the next stage is to have a plenary to approve all of the changes at the next meeting and clean the document.

At the previous meeting they had actions and one of them was to allocate Blake and Stuart to come up with a proposal regarding deployable ELTs. At 11:30 Joe from DRS and Stuart will demonstrate the proposal. Philippe asked everyone to review for the next meeting and suggested we hold a plenary session and dedicate the majority of time to carry out this review. If small working groups are required to look at in particular issues that can also take place.

Xavier asked for clarification as to how this will happen. Philippe said that he has the master document and each paragraph will be discussed one by one.
10. RTCA FRAC PRESENTATION

Stuart and Joe gave a presentation on their proposal for the update of the document regarding deployable beacons.

Joe described their discussions with Stuart regarding ED-112A and it was felt that the table in ED-62 covers the types of ED-62 and we should have a link to ED-112A. Basically this should be referenced in the document.

They discussed a recommendation for insertion into our document.

The recommendation can be found on the webspace [ELT-AD recommendation WG-98 SC-2229.docx]

Philippe asked the group if they felt this is the best way to carry out this work and there was general consensus.

11. ACTION ITEM REVIEW

Philippe Reviewed the Action Items and the following statuses were updated

<table>
<thead>
<tr>
<th>ACTION NUMBER</th>
<th>ACTIONONNEE</th>
<th>ACTION</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTION 1</td>
<td>PHILIPPE</td>
<td>TO POST THE LATEST VERSION OF ED-62REVB WORKING FOR REVIEW</td>
<td>Open</td>
</tr>
<tr>
<td>ACTION 2</td>
<td>GROUP MEMBERS</td>
<td>TO MAKE COMMENTS ON THE ABOVE PAPER</td>
<td>Continuous Action</td>
</tr>
<tr>
<td>ACTION 3</td>
<td>GROUP MEMBERS</td>
<td>TO REVIEW THE WORK OF WG2 FROM THE WEB SPACE</td>
<td>Continuous Action</td>
</tr>
<tr>
<td>ACTION 4</td>
<td>CLAUDE LELEA</td>
<td>CHECK CS/FAR DOCUMENTS 23, 25 27 AND 29 CHECKING PARAGRAPH NUMBERS REGARDING TEXT CHANGE TO SECTION 2.4 (OPERATION OF CONTROLS)</td>
<td>Done PPH to send to the group</td>
</tr>
<tr>
<td>ACTION 5</td>
<td>RICHARD ANDERSON</td>
<td>ACTION TO COMPLETE THE PARAGRAPH 6.1.11.6</td>
<td>Closed</td>
</tr>
<tr>
<td>ACTION 6</td>
<td>STUART TAYLOR</td>
<td>STUART TO PROVIDE FEEDBACK ON 4.1.1.1 ADD ALTERNATIVE G LEVELS APPROPRIATE FOR ROTOR CRAFT TO BE ALLOWED 6.14G (REF CAA SPEC 16)</td>
<td>Sent to Philippe Closed</td>
</tr>
<tr>
<td>ACTION 7</td>
<td>MARK</td>
<td>CONFIRM THAT AN AD AND AD (FDR) HAVE BUOYANCY REQUIREMENTS AND DO THEY MATCH THE CURRENT DEFINITIONS</td>
<td>Closed</td>
</tr>
<tr>
<td>ACTION 8</td>
<td>ED</td>
<td>CLEARLY DEFINE GNSS: INTERNAL, INTEGRAL, EXTERNAL. CLARIFY DEFINITION OF EXTERNAL GNSS WITH RESPECT TO DT; WITH RESPECT TO EXTERNAL IS IT AIRCRAFT INPUT ONLY OR POSSIBLE CELL PHONE?</td>
<td>Discussed after Lorient (Closed)</td>
</tr>
</tbody>
</table>
It was discussed that leaders and volunteers for small WGs would be required for proposing text on the various following issues:

- improve AD requirement Blake, Stuart, Ahmet
- address ADFR ELT requirement Blake, Stuart, Ahmet
- internal GNSS requirements for all types of ELT Especially for DT type where the acquisition time while in unusual and evolving attitude is important, Chris, EASA, Chip and Charisse, …
- 121.5 Homing modifications (current requirements sufficient?) Ed, Dan and same small group working on the 2nd generation homing
- 406 Homing (requiring type 1 and/or 2) Ed, George and same small group working on the 2nd generation homing

**ELT DT issues**

- address ELT DT, among other, in the environmental part of the standard, where now the ELT is supposed to be alive instead of standby during tests (acceptance criteria need revision) Philippe, Xavier, OEM and ELT manufacturers and volunteers
- installation requirements for ELT DT, Philippe, OEM and ELT manufacturers and volunteers
- define the functional interface requirements to the ELT DT (e.g. ARINC/Analog/digital) to include, output from triggering logic, how ELT (DT) is armed, activated, deactivated, and to trigger when Distress Tracking activation logic is disabled. Greg, Philippe Alain Bouhet, Claude Cresp, Christophe Horiot, Fadl, Xavier
• Installation instructions regarding autonomous power of external GNSS for ELT(DT)

End ELT DT issues
• Rechargeable non-lithium batteries, including potential criteria to trigger an alert when depleted, criteria to determine low capacity, Open for discussion

• RLS indication Chris HELIOS and GRICAS Xavier

• Other RLS feature Group in Fort Lauderdale agreed that there is no other RLS feature

• Cancellation cockpit control for manual activations George Xavier Chris Christophe

• Xavier’s proposal: Installation instructions regarding autonomous power of external GNSS for ELT(DT) WG TBD

• Xavier’s proposal: Combination of alerts for combined types (cancellation vs crash shock) WG TBD

• Xavier’s proposal: Integrate ELT unit/system discussion results WG TBD

12. FUTURE MEETING PLANS AND DATES

Tom reviewed the Millstones. He announced that the next meeting will be hosted by EASA. Xavier asked if we need to add an extra day and it was agreed that the meetings are extended to add the 17th as well. Calling notice will be issued shortly.

The following meetings were approved

<table>
<thead>
<tr>
<th>WG-98/SC-229 JM# 10: Koln</th>
<th>14 to 17 March 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>WG-98/SC-229 JM# 11: Washington</td>
<td>06 to 08 June 2017</td>
</tr>
<tr>
<td>WG-98/SC-229 JM# 12: Paris</td>
<td>5 to 7 September 2017 Draft for OC/FRAC</td>
</tr>
<tr>
<td>WG-98/SC-229 JM# 13: Washington</td>
<td>12 to 14 December 2017 Last meeting</td>
</tr>
</tbody>
</table>

13. OTHER BUSINESS

No other Business

14. ADJOURN

Philippe thanked Tom and ACR for hosting us and Rebecca, Stuart, everyone on WebEx and group members for attending.
## List of Actions

<table>
<thead>
<tr>
<th>ACTION NUMBER</th>
<th>ACTIONNEE</th>
<th>ACTION</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTION 1</td>
<td>PHILIPPE</td>
<td>TO POST THE LATEST VERSION OF ED-62REVB WORKING FOR REVIEW</td>
<td>Open</td>
</tr>
<tr>
<td>ACTION 2</td>
<td>GROUP MEMBERS</td>
<td>TO MAKE COMMENTS ON THE ABOVE PAPER</td>
<td>Continuous</td>
</tr>
<tr>
<td>ACTION 3</td>
<td>GROUP MEMBERS</td>
<td>TO REVIEW THE WORK OF WG2 FROM THE WEB SPACE</td>
<td>Continuous</td>
</tr>
<tr>
<td>ACTION 4</td>
<td>Philippe</td>
<td>Put CLAUDE’S PROPOSAL ON THE WEBSITE REGARDING HIS ACTION TO CHECK CS/FAR DOCUMENTS 23, 25 27 AND 29 CHECKING PARAGRAPH NUMBERS REGARDING TEXT CHANGE TO SECTION 2.4 (OPERATION OF CONTROLS)</td>
<td>OPEN</td>
</tr>
<tr>
<td>ACTION 5</td>
<td>MIKE BARTON</td>
<td>CLARIFY ICAO REQUIREMENT FOR ELT ADFDR DEPLOYMENT VS. ACTIVATION</td>
<td>OPEN</td>
</tr>
<tr>
<td>ACTION 6</td>
<td>PHILIPPE</td>
<td>TO SEND THE ARINC WHITE PAPER TO THE GROUP TO SEE IF IT CAN BE IMPROVED OVER WEBEX TO GENERATE SOME DISCUSSION</td>
<td>OPEN</td>
</tr>
</tbody>
</table>