

AC 20-160A – Field Review Comment Matrix

Originating Office: AIR-130	Document Description: Onboard Recording of Controller Pilot Data Link Communication In Crash Survivable Memory	Project Lead/Reviewer	Reviewing Office:	Date of Review:
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	Commenter	Section # and Page #	Comment	Suggested Change and Rationale	Disposition
1.	CSTA Comm TKraft	Title	Standard acronym and phraseology	Onboard Recording of Controller Pilot Data Link Communication (CPDLC) In Crash Survivable Memory	Agree. Incorporated as suggested.
2.	CSTA Comm TKraft	Cover letter	The AC is applicable only if the data communication system has CPDLC functionality. Phrase is not needed, suggest deleting.	“This advisory circular (AC) provides guidance on compliance with the airworthiness standards for onboard recording of Controller Pilot Data Link Communication (CPDLC) messages in crash survivable memory with aircraft that incorporate a data communication system. ”	Disagree. The AC is for an aircraft not a data communication system. Deleting the text as suggested would eliminate the context of the AC. Revised the text in the 1 st sentence, ‘data communication system’ to ‘CPDLC system’.
3.	CSTA Comm TKraft	1.1	What does “acceptable level of performance” mean?	Clarify paragraph to indicate the following: “This AC provides guidance and means for applicants to show that aircraft data link recording capability complies with applicable regulations in CFR, shown in Table 1 of this AC.” The data link communication (DLC) equipment” as used in the regulations, includes the components installed on the aircraft that are necessary to provide CPDLC. CPDLC message set(s) are identified by interoperability criteria	Rewrote paragraph without the text “acceptable level of performance”.

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				provided in AC 20-140C (or later).” Or use language similar to what is provided in the cover letter.	
4.	CSTA Comm TKraft	1,1	Is “controller-pilot data communication” same as “CPDLC”?	“...system that records controller-pilot data communication CPDLC messages. ...“	Agree. Incorporated as suggested.
5.	CSTA Comm TKraft	1.2	Where does AC focus on “aircraft recording performance”??? See Section 7. Also, use “CPDLC messages”	“...focus on data to be recorded aircraft recording performance and logical recording point locations <u>onboard the aircraft</u> for storing controller-pilot data link communication information CPDLC messages in onboard ...”	Agree. Incorporated as suggested.
6.	CSTA Comm TKraft	2	CPDLC message sets are standardized by ICAO PANS-ATM, GOLD Manual (Doc 10037) and interoperability standards. I could not find anything in this AC to help FAA staff to standardize message sets for retrieval.	“... This AC will also help Federal Aviation Administration (FAA) staff to standardize <u>the approval process for the data link communication recording equipment</u> data link communication message sets for retrieval from crash survivable memory. ”	Agree. Incorporated as suggested.
7.	CSTA Comm TKraft	4	Should addition of AC 20-CVR be described as significant change here? Refer to Section 9.	Add paragraph on AC 20-CVR.	Disagree. 4.1.3 includes text to indicate that AC 20-CVR is the updated AC to provide associated guidance.

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8.	CSTA Comm TKraft	4.1.1	<p>These message sets have not been developed, yet. The standards were recently published, but further validation is needed, and revision to the standards. As a performance-based AC, I'm not sure why it needs to be revised when CPDLC is implemented using new standards, technology, etc. I suggest referring to AC20-140 in this AC, as it does, and identifying the message sets by their respective technology (FANS 1/A, ATN B1, B2a and B2b) in AC20-140 (rev A, B, C or later). There is no need to update this AC every time there is a new interop standard for a CPDLC message set. As the AC is written now, B2a and B2b appear only in this paragraph and as an e.g. in Note 1 following paragraph 7.2. You can delete this paragraph in its entirety and the</p>	<p>“This AC adds reference to newly developed standards that define CPDLC message sets for “Baseline 2” data communications protocol. Baseline 2 comprises includes two different CPDLC versions; this AC refers to them red to as B2a and B2b, which are correlated to the different CPDLC versions provided in the B2 standards by AC 20-140C. The FAA is planning to use Version B2b is planned for use in the U.S. National Airspace System as part of FAA’s NextGen initiative, and is targeting 2025 for implementation. Refer to AC 20-140C, <i>Guidelines for Design Approval of Aircraft Data Link Communication Systems Supporting Air Traffic Services (ATS)</i>, for additional information.”</p>	<p>Agree. Incorporated as suggested.</p>

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			(e.g. ...) in 7.2, so the AC is not sensitive to the addition/change of CPDLC message sets.		
9.	CSTA Comm TKraft	4.1.1	“B2a” and “B2b” terms are not defined by the RTCA/EUROCAE standards and have not yet been vetted by ICAO. I suggest that we harmonize with ICAO. If for some reason that is not clear to me that this AC needs to include the RTCA/EUROCAE B2 CPDLC message sets, I suggest that it be clear that it is for planning purposes only. Not for implementation, as the FAA has not committed the program yet and won’t before 2025,	See previous comment on 4.1.1.	Agree. Incorporation of suggested text associated with previous comment on 4.1.1 is considered to resolve this comment too. Recording B2b messages only become relevant after an applicant seeks approval of B2b with associated guidance provided in AC 20-140C
10.	CSTA Comm TKraft	4.1.2	What does “incorporates” mean here as an important change to the AC? The policy update and clarification is applicable to the operating rules listed, not the ones in Table 1 above.	“This AC incorporates refers to the March 2, 2015 policy update and ...”	Agree. Incorporated as suggested.

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11.	CSTA Comm TKraft	5	Data link communication technology will not replace voice communications. In many cases, the voice communication is needed to mitigate the effects of some data link hazards, such as loss of the data link, or when the communication requires controller-pilot interaction, not possible with data link, or faster performance on the VHF voice channel.	“... We are increasingly relying on data link communication technology <u>to provide more advanced air traffic management operations that otherwise could not be provided with to replace</u> voice communications between pilots and air traffic control . “	Agree. Incorporated as suggested.
12.	CSTA Comm TKraft	5	“... information” is not “the tools”.	“... information in crash survivable memory gives investigating authorities the tools <u>information that contributes to</u> for post-accident or -incident reconstruction.”	Agree. Incorporated as suggested.
13.	CSTA Comm TKraft	6.1 (Note)	I suggest moving this URL reference here to where you list other references for ACs, TSOs, InFOs, e tc. in Section 11.	is at Docket No. FAA-2015-0289, which you may view online at <u>https://www.federalregister.gov/articles/2015/03/02/2015-04158/policy-regarding-datalink-communications-recording-requirements</u> .	Disagree. Section 11 provides a generic link to ACs, TSOs, InFOs. A link to the Federal Registry and then user of this AC to search for Docket No. FAA-2014-0289 is not intuitive. Reference only to this specific

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					Docket No. better if provided in the body of the AC. Specific reference to the Docket only adds two lines to the AC and no other Dockets will need to be acquired.
14.	CSTA Comm TKraft	7.1	Does this need to be updated for B2a and B2b. For example, even FANS 1/A CPDLC uplink messages require a timestamp of when the ground system sent the message to the aircraft. Certainly, this is a requirement for B2a and B2b uplink messages as well	As a minimum, ED-93 should be revised to require recording of the timestamp of when the ATS unit system send CPDLC message that is recorded on the aircraft.	Disagree. Requirements in ED-93 are not specific to a CPDLC data link application; hence, the crew recording requirements apply to ATB B1, FANS 1/A+, B2a, and B2b. AC was revised to correct the references to Sections 2.3 2.1 and 2.3 2.2
15.	CSTA Comm TKraft	7.2	No need to spell out. Also, there's a stray "data" in the sentence.	AC 20-140C, or later approved revision, define the <u>Controller Pilot Data Link Communications (CPDLC) data</u> message set(s) that the system must record.	Agree. Incorporated as suggested.
16.	CSTA Comm TKraft	7.2 Note 1	This AC can be performance-based and "technology" agnostic. This is the only other	"... CPDLC message set depends on the data link system you are implementing (<u>e.g. ATN B1, FANS 1/A, B2a or B2b</u>) as identified by AC 20-140C (or	Agree. Incorporated as suggested.

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			place B2a and B2b appear, and as an example.	later). ...”	
17.	CSTA Comm TKraft	7.2 Note 2	PANS-ATM (Doc 4444) does not include B2a or B2b and is not expected to before 2020. The GOLD Manual (Doc 10037) is targeted to be updated to include planning information for B2, technically mature by May 2017, and published by November 2017, but the AC makes no reference to the GOLD. I note that the ICAO work does not define or refer to “B2a” or “B2b”. However, such terms may be relevant in the process of updating the GOLD Manual.	Delete Note 2. Reference to AC 20-140C (or later) is sufficient in this AC on where to go to find the CPDLC message sets. If correlation of technology-specific CPDLC message sets to PANS-ATM message sets is desired, do this in AC 20-140C (or later).	Agree. Incorporated as suggested.
18.	CSTA Comm TKraft	7.2 and 7.2 Note 2	Refer to Table 4 or A-1 (as applicable). What determines the applicability of one table versus another? Why two different tables for different CPDLC message sets? Confusing.	Refer to one table or section of the AC 20-140C that identifies all the acceptable CPDLC message sets.	Agree. Section 7.2 (including the Note) now relies upon the Interoperability Criteria defined in AC 20-140C in lieu of indicating a specific “Table” or “Interop Designator”.

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19.	CSTA Comm TKraft	7.2 Note 2	For B2a or B2b, there would be many message that would not correspond to the message use/intent column of the tables contained in Doc 4444, Appendix 5, because PANS-ATM does not contain the B2 CPDLC message set.	Delete Note 2. See other comments on 7.2 Note 2.	Agree: Note 2 has been deleted.
20.	CSTA Comm TKraft	7.2 Note 2	I think you can and should delete note 2 rather than try to fix it. Para 7.2 refers to AC 20-140C (or later), which should clearly identify the CPDLC message set(s) that are subject to this AC 20-160.	Delete Note 2. See other comments on 7.2 Note 2.	Agree. Incorporated as suggested.
21.	CSTA Comm TKraft	7.3	Do TSO C177a and ED-112A need to be updated to consider B2a and B2b?	Update ED-112A and C177a, as necessary.	Disagree. ED-112A and TSO-C177a does not need to be updated.
22.	CSTA Comm TKraft	9	Is incorporating a new AC that provides guidance on maintenance program requirements a significant change and should be described in Section 4 above.	See comment on section 4 to add paragraph to explain this significant change.	Disagree. Reference to 20-CVR as a change within AC 20-160A is identified indirectly by the text in 4.1.3.
23.	AIR-400 Higginbotham	6.1 and 10.5, pages 2 and 4	6.1 NOTE mentions InFO 160004; 10.5 mentions InFO 16004	Three zeroes or two zeroes?	Agree. Modified AC as suggested.

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24.	AIR-400 Higginbotham	10.6.1	No period after 27	Add period after 27 to be consistent with sections 10.6.2 and 10.6.3.	Agree. Modified AC as suggested.
25.	AIR-400 Higginbotham	10.6.2	Space missing.	Add space between 6.10.1.5.1 and “Amendment”	Agree. Modified AC as suggested.
26.	AIR-400 Higginbotham	General	Yes, I really read the whole thing.		No comment
27.	ACE-117C J. Raspanti	6.1, page 2	Clarify the Note: “and on what aircraft must comply with these rules.”	“and the recording requirements for aircraft manufactured prior to the effective rule date versus those manufactured after the effective rule date.”	Disagree. Recording rule applies to new production aircraft (i.e. forward fit) and aircraft that are retrofitted. The recording rule is driven by the Operational Rule and not an Airworthiness Regulation. AC 20-160A provides hyperlink references to the updated FAA Policy and published INFO bulletin to clearly indicate the applicant seeking an airworthiness approval should consider the Operating Rule, policy

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					and INFO bulletin for their implementation to determine if datalink recording needs to apply in their application for an airworthiness approval.
28.	ANM-111 Nazih Khaouly	Section 1.1, Page 1	“This advisory circular (AC) offers one way to achieve an acceptable level of performance for an aircraft recording...”	The purpose of the AC is to provide guidance not to define the recording performance. Consider revising this paragraph to “This advisory circular (AC) offers guidance for...”	Rewrote paragraph without the text “acceptable level of performance”.
29.	ANM-111 Nazih Khaouly	Section 4.1.2, Page 1	“This AC incorporates the March 2, 2015 policy update and clarification to the data link recording rules of Title 14, Code of Federal Regulations (14 CFR), parts 91, 121, 125, and 135”.	Include the policy number that paragraph 4.1.2 is making reference to.	Disagree. Detail to this policy update is provided in Paragraph 6.1. Paragraph 4.1.2 only indicates this as an important change in the AC.
30.	ANM-111 Nazih Khaouly	Section 6.1, Page 2	The InFO 160004 link does not always work properly.	Include the Info 160004 as an attachment to the AC.	Disagree. AC uses material external to the AC for multiple situations, e.g. Federal Register, MOPS, etc. For convenience, the AC provides a hyperlink for material external to the AC.

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					Including all this external material within the AC would be problematic in many ways; hence, keeping this material external to the AC is considered to be best.
31.	ANM-130L Vonnie Tong	Section 4.1.1, Page 1	In this section, it stated “This AC adds reference to newly developed message sets for “Baseline 2” data communication protocol”. Does this statement assume the previous AC 20-160 message sets are still valid? If they are, this AC 20-160A needs to add the reference(s) in Section 7.1 for EUROCAE document ED-93, Appendix D.2 CPDLC.	Clarify section 4.1.1 for the message sets baseline, and updated section 7.1 if applicable.	Disagree. AC 20-160 used Appendix 5 of PANS ATM to indicate which CPDLC messages need to be recorded. PANS ATM has been revised to rely upon INTEROP standards to define the CPDLC message set. Paragraph 7.2 relies upon AC 20-140C to define the CPDLC messages that need to be recorded for each Interop Designator.
32.	ANM-130L Vonnie Tong	Section 7.2 & Note 2, Page 3	In section 7.2 , it stated “...define the Controller Pilot Data Link Communications	If CPDLC data message set(s) satisfied the ICAO Document 4444, Appendix 5 requirements, then the interoperability criteria in Table 4 or A-1 (as	Agree. Note has been deleted.

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			(CPDLC) data message set(s) that the system must record.”, but in Note 2, it stated “When applicable, we also consider other proposed CPDLC message(s) not included in the interoperability criteria in Table 4 or A-1 (as applicable) of AC-140C...” This requirement needs clarification.	applicable) of AC-140C will be applied.	
Disposition and incorporation of the following comments performed with Public Review Comments					
33.	Joy Wolf	4.1.1 page #1	you skipped a level with 4.1.1, 4.1.2, and 4.1.3	Change them to 4.1, 4.2, and 4.3	Agree. Modified as suggested.
34.	Joy Wolf	6.1 page #2	You should not have a 6.1 without a 6.2	Leave off the 6.1	Agree. Modified as suggested.
35.	Joy Wolf	7.3.1 page #3	You should not have a 7.3.1 without a 7.3.2	leave off the 7.3.1	Agree. Modified as suggested.
36.	Joy Wolf	Feedback form last page	change 9-AWA-AVS-AIR500-Coord@faa.gov to 9-AWA-AVS-AIR-DMO@faa.gov		Agree. Modified as suggested.
37.	Joy Wolf	Summary on the first page	Since there is spacing from the table, there should be 0 spacing instead of 24 pt	change to 0 pt	Agree. Modified as suggested.
38.	Joy Wolf	Table 1 on page#2	Why is Subpart F-Equipment on a line by itself? Is that part	If so, add it to the description box in the header of the table	Disagree. The three identified regulations

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			of the description?		in Table 1 are part of Subpart F of Part 23/25/27/29. We could delete the row but then the regulations would not be identified to be part of Subpart F.
39.	Joy Wolf	Table 1 on page#2	Function and installation under 14 CFR Part 25 need a pace between § and the number		Agree. Modified as suggested.
40.	Joy Wolf	6.1 Note on page #2	14 CFR §91.609, §121.359, §125.227, and §135.151 all need spaces between the § and the number		Agree. Modified as suggested.
41.	Joy Wolf	6.1 Note on page #2	The FAA published a policy update and clarification to these rules in the Federal Register on March 2, 2015, with additional information on the definition of datalink communication equipment and on what aircraft must comply with these rules.	too wordy, it is confusing	Disagree. Although the note is long it is not considered confusing and was written to be as concise as possible.
42.	Joy Wolf	7.2 on page #3	The applicable interoperability criteria of the data link system contained in Table 4 or A-1 (as applicable) of AC 20-140C, or	Simplify this, it should not be one sentence	Agree. Modified paragraph to be simpler.

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			later approved revision, define the Controller Pilot Data Link Communications (CPDLC) data message set(s) that the system must record.		
43.	Joy Wolf	7.2 Note 2 page #3	When applicable, we also consider other proposed CPDLC message(s) not included in the interoperability criteria in Table 4 or A-1 (as applicable) of AC 20-140C or later that satisfy the Message Use/Intent column of the tables contained in ICAO Document 4444, Appendix 5, to also be mandatory for recording.	Simplify this, it should not be one sentence	Agree. Note 2 has been deleted.
44.	Joy Wolf	10.6 on page #4	International Civil Aviation Organization (ICAO) International Standards and Recommended Practices-- Operation of Aircraft, Annex 6, specify onboard recording requirements. These sections apply: - These needs 2 spaces between the sentence		Agree. Modified as suggested.
45.	Joy Wolf	10.6.1 on page #4	§§ 6.3.1.5 and 6.3.1.5.1, Amendment 27 Recording	§§ 6.3.1.5 and 6.3.1.5.1, Amendment 27, Recording requirements for commercial air	Agree. Removed Amendment level in

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			requirements for commercial air transport.	transport.	reference.
46.	Joy Wolf	10.6.2 on page #4	§§ 6.10.1.5, and 6.10.1.5.1 Amendment 19. Recording requirements for general aviation.	§§ 6.10.1.5, and 6.10.1.5.1, Amendment 19, Recording requirements for general aviation.	Agree. Removed Amendment level in reference.
47.	Joy Wolf	10.6.3 on page #4	§§ 4.9.1.5 and Amendment 6. Recording requirements for helicopters.	§ 4.9.1.5 and Amendment 6, Recording requirements for helicopters.	Agree. Removed Amendment level in reference.
48.	Joy Wolf	11.2 on page #5	2 spaces between sentences 20036-4001. Telephone (202)	20036-4001. Telephone (202)	Agree. Modified as suggested.
49.					