# Comments on ARINC 665-4 Draft 2

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| Reference | Comment |
| General | The document is very random with respect to when terms are capitalized. For example either ‘header file’ or ‘Header File’ should be used consistently throughout. Other examples are data file, support file, user defined data, check value and batch file. |
| §1.1 ¶1 | ‘ensure’ would be better than ‘insure’ (at least outside the US). |
| §1.1 ¶1 | For consistency, ‘a Media Set containing’ should be ‘an MSP containing’. |
| §1.1 ¶3 | ‘MSP’ has been omitted when ‘Media Set’ was removed. |
| §1.1 ¶4 | ‘definition’ should be ‘definition**s**’. |
| §1.1 ¶4 | ‘LSP’ should be ‘LSP or MSP’. |
| §1.2 ¶2 | ARINC 838 is not just an XML-based standard - it is also a binary one. It is not good for the introduction to one standard to perpetuate a myth concerning another. Some guidance is needed on when to use ARINC 838 and when to use ARINC 665. As I understand it, ARINC 838 is intended to be a replacement (not an alternative) to ARINC 665. |
| §1.2 ¶2 | Presumably ARINC 838 applies to the complete class of LSPs and its use is not restricted to LSAPs? |
| §1.3.1 ¶1 | For consistency, ‘loadable software,’ should be ‘Loadable Software Parts’. |
| §1.3.1 ¶1 | ARINC 665 is a ‘standard’, not a ‘recommendation’. Thus ‘meeting the recommendations of this report’ should be ‘comply with this standard’. |
| §1.3.1 ¶2 | Should all occurrences of ‘should’ be changed to ‘shall’ to match current ARINC and industry standard practice? |
| §1.3.1 ¶2 | The clause ‘for the unit’ should be removed - this standard applies to tools as well as units. |
| §1.3.2 ¶1 | Why does ‘Hexadecimal’ have a capital ‘H’? |
| §1.3.3 ¶1 | ‘as numeric’ should be ‘as being of a’. |
| §1.3.3 ¶1 | For consistency, ‘Check value’ should be ‘Check **V**alue’. |
| §1.4 ¶1 | ‘Loadable Software Parts (LSPs)’ should be ‘LSPs/MSPs’. |
| §1.4.1 ¶1 | ‘Number’ should be dropped from ‘File Format Version Number’ – ‘Number’ is not used throughout the rest of the document. |
| §1.4.1 ¶1 | For consistency, ‘Media’ should be ‘Media Set Part’. |
| §1.4.1 ¶2 | The first occurrence of the term ‘load’ appears here. The SDL has decided to use the term ‘loadable software part (LSP)’ consistently in future. If it is considered too much work to eliminate this term from ARINC 665, there should at least be some commentary to explain the term ‘load’ is shorthand for ‘LSP’ throughout the rest of the document. Personally, I would eliminate it entirely. |
| §1.4.1 ¶3 | Surely the versions need to change in this supplement to 0x8005, 0x9005 and 0xA005? Some explanation that the last nibble is supplement specific would be useful. |
| §1.4.1 ¶4 | ‘Load File format version’ should be either ‘Load File **F**ormat **V**ersion’ or ‘**l**oad **f**ile format version’. |
| §1.4.1 ¶4 | To allow 0x8004 **and 0x8005** to remain compatible with 0x8003... |
| §1.4.1 ¶2 | ‘Loadable Software Standard’ should be ‘Loadable Software Standard**s**’. |
| §1.4.2 ¶2 | The clause beginning ‘except’ is superfluous – if a field is defined in a report it is not their ‘own definition’. |
| §1.4.3 ¶1 | ‘LSPs’ should be ‘LSPs/MSPs’. |
| §1.4.4 ¶4 | ‘with actual definition of the Header Field format’ should be ‘in the case of the Header **File** format’. |
| Figure 1.4.4 | It would be clearer to use 02, 06 and 08 in the explanation below the figure. |
| Figure 1.4.4 | Why does ‘Word 2’ have a capital ‘W’? |
| §1.5 ¶7 | Why does ‘Load’ have a capital ‘L’? |
| §1.6 ¶1 | The last instance of ‘parts’ should be removed. |
| §1.6 ¶2 | For consistency, ‘batch files’ should ‘Batch Parts’. |
| §1.6 ¶2 |  The clause ‘loadable software’ should be removed. |
| §1.6 ¶3 |  ‘parts received are exactly that’ should be ‘**that the** parts received are exactly **those**’. |
| §1.6 ¶4 | For consistency, ‘Media Sets’ should ‘MSPs’. |
| §1.6 ¶4 | Why does ‘Part’ have a capital ‘P’? |
| §2.1 ¶2 | ‘to the part’ should be eliminated. |
| §2.1 ¶2 | ‘to the load should be eliminated. |
| §2.1.1 ¶4 | ‘alpha characters’ should be ‘the letters’. |
| §2.1.1 ¶4 | The last sentence applies to the whole PN (not just the supplier code) and should be a separate paragraph. |
| §2.1.1 ¶8 | Why does ‘Alphabetic’ have a capital ‘A’? |
| §2.2.1 ¶2 | This conflicts with section 2.2.3.2 which allows bytes. |
| §2.2.1 ¶4 |  ‘a Media Set Part (MSP)’ should just be ‘an MSP’. |
| §2.2.1 ¶5 | Should ‘loadable media set parts’ just be ‘MSPs’? If so what is the difference between MSP and MSP structure. The response to this comment may also influence the next paragraph. |
| §2.2.1 ¶11 | This paragraph should be merged with paragraph one which already discusses case sensitivity. |
| §2.2.2 ¶1 | Why does ‘File’ have a capital ‘F’? |
| §2.2.2 ¶2 | For consistency, ‘Header filename’ should be ‘Header **F**ile name’. |
| §2.2.2 ¶2 |  ‘creator file’ should be ‘creator **of the** file’. |
| §2.2.2 ¶5 | Should the use of ‘Z’ also be prohibited as in section 2.1.1? Presumably lower case i, o and q are not prohibited as is implied here? |
| §2.2.2 ¶5 | The letters are not ‘English’ (as I’m sure our colleagues from Airbus and Saffran would point out). |
| §2.2.2 ¶6 | ARINC 838 adds further restrictions on allowed characters. Why should ARINC 665 be different? |
| §2.2.2 ¶8 | Why is this restriction required? It seems quite draconian. If this restriction is to exist, then the commentaries in section 2.2.3.1.34 and 2.2.3.1.47 have become superfluous because file names are required to be unique across all LSPs (never mind with within an LSP). |
| §2.2.2.1 ¶1 | ‘Filename Extension’ should be ‘File name extension’. |
| §2.2.2.2 ¶1 | Why does ‘Name’ have a capital ‘N’? |
| §2.2.2.3 | For consistency, heading should have no ‘s’. |
| §2.2.2.3 ¶1 | Eliminate ‘named’. |
| Table 2.2.3-1 | What is the point of ‘Expansion Point No. []’? There is no explanation concerning it. |
| Table 2.2.3-1 | Why is the ‘Field Size’ description for ‘User Defined Data’ different to other fields of variable width (e.g. ‘Support File PN’)? |
| Table 2.2.3-1 | The original text for notes 1 and 2 was more precise than the amended versions. |
| §2.2.3.1.7 ¶1 | Why does the phraseology of this note differ from that for 2.2.3.1.7? |
| §2.2.3.1.17 ¶2 | Eliminate ‘on’. |
| §2.2.3.1.18 | ARINC 838 provides a simplified description of software type ID which expects a one-to-one correspondence between ID and description. Is there a reason why ARINC 665 is so complicated in this respect? |
| §2.2.3.1.27 ¶1 | The last sentence has two ‘if‘ conditions when only one is required. |
| §2.2.3.1.28 ¶1 | Why is there an instance of ‘Position’ in bold italics? |
| §2.2.3.1.32 ¶2 | Why are there double quotes around Data File Pointer? |
| §2.2.3.1.34 ¶3 | It would be better to state that the name should be unique within the LSP (rather than within the PN). |
| §2.2.3.1.36 | For consistency, ‘data file part number’ should be ‘Data File PN’. |
| §2.2.3.1.36 ¶4 | ‘assigner’ should be ‘assigned’. |
| §2.2.3.1.37 | For consistency, ‘data file length’ should be ‘Data File Length’. |
| §2.2.3.1.37 ¶1 | This conflicts with section 2.2.1 which states that the data file must consist of 16-bit words (meaning no half words are allowed). |
| §2.2.3.1.45 ¶2 | Why are there double quotes around Data File Pointer? |
| §2.2.3.1.37 ¶3 | It would be better to state that the name should be unique within the LSP (rather than within the PN). |
| §2.2.3.1.49 ¶3 | For consistency, ‘support file part number’ should be ‘Support File PN’. |
| §2.2.3.1.49 ¶4 | This paragraph is redundant due to the addition to the previous one. |
| §2.2.3.1.57 ¶1 | Shouldn’t there be a statement that this is omitted if there is a null pointer to it (as for all other similar areas accessed by pointer). |
| §2.2.3.1.60 ¶1 | ‘Header file Check Value Length’ should be ‘Load Check Value Length’. |
| §2.2.3.1.61 ¶1 | For consistency, ‘type’ should be ‘**T**ype’. |
| §2.2.3.1.61 ¶2 | This description is not precise enough. It should be brought in line with the new text for the Load CRC in section 2.2.3.1.63. |
| §2.2.3.1.63 ¶1 | Why are there double quotes around Load CRC? |
| §2.2.3.2 ¶1 | This conflicts with section 2.2.1 which states that the data file must consist of 16-bit words. |
| §2.2.3.3 ¶1 | ‘8-bit words’ should be ‘8-bit bytes’ (or just ‘bytes’). |
| §2.3.1 ¶1 | ‘Target Hardware’ should be ‘Target Hardware Position’. |
| §2.3.1 ¶2 | ‘Target Hardware ID position’ should be ‘Target Hardware Position’. |
| §2.3.1 ¶5 | There is no ‘Figure C-6’! |
| §2.3.1 ¶5 | Here the concept of a Batch File Part is introduced but in the existing text it is just known as a Batch File. In section 1.6 it is just Batch Part. One of these terms should be used consistently throughout the standard. |
| §2.3.1 ¶7 | ‘creator file’ should be ‘creator of the file’. |
| §2.3.1 ¶10 | For consistency, ‘position’ should be ‘Position’. |
| Table 2.3.1-1 | For consistency, ‘Load-list’ should be ‘Load-**L**ist’. |
| Table 2.3.1-1 | The original text for notes 1 and 2 was more precise than the amended versions. |
| §2.3.1 ¶12 | ‘filed’ should be ‘field’ (in note 1) |
| §2.3.1.5 ¶1 | For consistency, ‘Load List’ should be ‘Load-List’ (including in title). |
| §2.3.1.7 ¶1 | This should be split into two sentences and worded in the same way as for other length fields (e.g. 2.2.3.1.16). |
| §2.3.1.8 ¶1 | ‘Batch File PN Field’ should be just ‘Batch File PN’. |
| §2.3.1.9 ¶1 | This should be split into two sentences and worded in the same way as for other length fields (e.g. 2.2.3.1.16). |
| §2.3.1.12 ¶1 | Should state that this is a relative pointer and be worded in the same way as section 2.2.3.1.32. |
| §2.3.1.13 ¶1 | This should be split into two sentences and worded in the same way as for other length fields (e.g. 2.2.3.1.16). |
| §2.3.1.14 ¶1 | ‘Target HW ID POS Field’ should be just ‘Target HW ID POS’. |
| §2.3.1.15 ¶1 | This should be split into two sentences and worded in the same way as for other length fields (e.g. 2.2.3.1.16). |
| §2.3.1.17 ¶3 | Uses ‘shall’ where elsewhere ‘should’ is used. |
| §2.3.1.17 ¶3 | Having referred to section 2.2.2, is there any need for the remaining text? |
| §3.1 ¶3 | For consistency, ‘media set PN’ should be ‘**M**edia **S**et PN’. |
| Table 3.2.2.1-1 | .BDF and .XDF should be added to this table. |
| Table 3.2.2.1-1 | The definitions of ‘Download’ files are not consistent with those in ARINC 838. Specifically, ‘**D**own**l**oad’ should be ‘**d**own**L**oad’ and ‘Disk’ should be ‘Media’. |
| Table 3.2.3.1-1 | ‘+\* Target HW ID Length’ is too far indented. |
| §3.2.3.1.4 ¶1 | Why are there double quotes around Media Set PN Length? |
| §3.2.3.1.5 ¶1 | Why are there double quotes around Number of Loads? |
| §3.2.3.1.6 ¶1 | Why are there double quotes around User Defined Data? |
| §3.2.3.1.8 ¶1 | ‘appended file’ should be ‘appended **to** fill’. |
| §3.2.3.1.13 ¶2 | Why are there double quotes around Load Pointer? |
| §3.2.3.1.15 ¶1 | For consistency with 3.2.3.1.21, ‘(ASCII 0x00)’ should be eliminated. |
| §3.2.3.1.17 ¶2 | Why are there double quotes around Header File Name? |
| §3.2.3.1.24 ¶1 | Missing ‘if’ at start of second sentence. |
| §3.2.3.2 ¶4 | Won’t the ‘FILES.LUM File Check Value’ also vary across media set members? |
| Table 3.2.3.2-2 | ‘File’ should be eliminated from ‘Pointer to File Number of Media Set Files’. |
| Table 3.2.3.2-2 | Why does this file contain a field named ‘Sequence No.’ whilst the two others contain a field named ‘Sequence Number’? |
| §3.2.3.2.14 ¶1 | Why does the last ‘File’ have a capital ‘F’? |
| §3.2.3.2.16 ¶2 | ‘an NUL’ should be ‘a NUL’. |
| §3.2.3.2.16 ¶4 | Why are there double quotes around File Name? |
| §3.2.3.2.16 ¶4 | Eliminate surplus ‘File Names.’ at end of paragraph. |
| §3.2.3.2.17 ¶1 | ‘File Name’ should be ‘File Pathname’. |
| §3.2.3.2.18 ¶3 | ‘Pathname’ should always be ‘File Pathname’. |
| §3.2.3.2.22 ¶1 | Is it really allowed to set the Check Value Type to zero? Isn’t the correct way to omit a check value to set the Check Value Length to zero? |
| §3.2.3.2.23 ¶1 | ‘Files.Lum File Check Value type’ should be ‘File Check Value **T**ype’. |
| §3.2.3.2.26 ¶1 | For consistency, ‘pointer’ should be ‘**P**ointer’. |
| §3.2.3.2.29 ¶1 | This section does not explain how the check value is calculated. Presumably it covers the entire FILES.LUM file up to (but not including) FILES.LUM Check Value Length? |
| §3.2.3.3 ¶1 | Why does ‘Optional’ have a capital ‘O’? |
| Table 3.2.3.3-1 | For consistency, ‘Batch’ should be ‘Batch File’ (in the last note). |
| §3.2.3.3.4 ¶1 | ‘Information’ should be ‘Set PN Length’. |
| §3.2.3.3.5 ¶1 | ‘Batch List’ should be ‘Number of Batches’. |
| §3.2.3.3.5 ¶1 | Why are there double quotes around Number of Batches? |
| §3.2.3.3.6 ¶1 | Why are there double quotes around User Defined Data? |
| §3.2.3.3.11 ¶1 | Why is this worded slightly differently to the equivalent fields for LOADS.LUM and FILES.LUM? |
| §3.2.3.3.12 ¶1 | For consistency, ‘Batch List’ should be ‘**b**atch **l**ist’. |
| §3.2.3.3.13 ¶1 | For consistency, ‘Batch’ should be ‘Batch File’. |
| §3.2.3.3.16 ¶1 | The wording for this section is not consistent with that for other length fields (e.g. 3.2.3.3.14). |
| §3.2.3.3.18 ¶1 | Eliminate ‘for this Batch’. |
| §3.2.3.3.21 ¶1 | Why does this definition differ from that for 3.2.32.26 (which is better). |
| §3.2.4 | It is not clear (to me) whether it is allowed to split loads across multiple media members. This could be represented by records in the load list that are identical in all respects other than media member sequence number. |
| §3.2.4.1 | FILES.LUM contains a member sequence number for each constituent file of the media set. If a file is allowed to exist on many media members, how is this handled in FILES.LUM. Are there multiple file ‘records’ which are identical in all respects other than member sequence number? If FILES.LUMs on different media members were allowed to reference different copies of the files, this would be another conflict with the last paragraph of 3.2.3.2. |
| §3.2.4.1 | For consistency, ‘load PN’ should be ‘**L**oad PN’. |
| §3.2.4.3 ¶2 | References should be to 2.2.3.1.34 and 2.2.3.1.47. |
| §4.0 | Should ARINC 665 now support 64-bit CRCs (as does ARINC 838). |
| §4.2 ¶1 | This amendment does not belong in this section which is about CRCs in general (and barely specific to ARINC 665). It should not mention check values. It is better to cover this material with precision in section 2 rather than repeat it imprecisely here. |
| Table 4.3-1 | In the note below the table, ‘and’ should be ‘any’ and ‘algorithym’ should be ‘algorithm’. |
| §5.1 ¶2 | Check value length and check value type are both in fact 16-bit words (allowing 65535 check value **type**s!). |
| §5.1 ¶3 | ‘“Big Endian”’ should be ‘big endian’. |
| §5.2 | Given that section 4.3.1 and 4.3.2 now preclude the use of 8-bit CRCs and 16-bit CRCs as check value types, why are they still allowed check value types? Shouldn’t it be pointed out that these are now deprecated and merely included for backwards compatibility? |
| §5.2 | In ARINC 838 we decided to support 64-bit CRC, two new SHA-2 variants and to deprecate the use of MD5. Should we do the same here? |
| §5.2 ¶1 | ‘that the LSP of BFP part numbers’ should be ‘than LSP or BFP part numbers’. |
| §5.2 ¶2 | ‘8-bit Words’ should be ‘8-bit Bytes’ (or just ‘Bytes’). |
| Figure A-1 | The Header File block is now quite out of date and does not include features added in later standard versions (e.g. load type, check values). |
| Figure A-1 | 16-bit words are no longer mandated. |
| Figure A-1 | The typical names for data files and support files do not seem to match the rest of the document. In practice, are these types of file names really ‘typical’? |
| Figure B-1 | Shouldn’t this figure show a different set of loads on the two media members?  |
| Figure B-1 | Why ‘Header for LOAD #1’ but ‘HEADER FILE LOAD #N’?  |
| Figure B-1 | Why is ARINC 615A-3 referenced here?  |
| Figure B-1 | The figure implies that LOADS.LUM and FILES.LUM are identical on all media members when they are not (because they include media sequence number).  |
| Figure C-1 | Why are ‘PN’ and some ‘s’ characters in bold italics?  |
| Figure C-1 | ‘Number of Target HW ID with Position’ should be ‘Number of Target HW ID with Position**s**’. |
| Figure C-1 | There should be a bold table boundary above ‘Number of Data Files’ and no blank row above ‘Number of Support Files’. |
| Figure C-4 | ‘Pointer to Media Information’ should be ‘Pointer to Media Set PN Length’. |
| Figure C-4 | ‘Pointer to Load List’ should be ‘Pointer to Number of Loads’. |
| Figure C-5 | ‘Pointer to Media Information’ should be ‘Pointer to Media Set PN Length’. |
| Figure C-5 | ‘Pointer to File List’ should be ‘Pointer to Number of Files’. |
| Appendix C | Why is there no file format diagram for batch files? |
| Appendix H | ‘List-of Loads’ should be ‘List-of-Loads’. |
| Appendix H | ‘Loadsite’ is not used anywhere – so it seems a bit pointless to define it. |
| Appendix H | The second paragraph pertaining to ‘Load Source’ should be eliminated. |
| Appendix I | Why is ARINC 838 categorised as a 2 and not a 3? |
| Appendix I | Strictly, ASCII should be categorised as a 1. |
| Appendix M | Section M-3.2 should be M-3.1.3. |