| **Color Codes** | **Satisfied (might be slightly different from suggestion)** | **Needs discussion (see my comments)** | **Rejected (see my comments)** |
| --- | --- | --- | --- |
| **0** | **Pg** | **Sec** | **Para** | **Line** | **Type** | **Comment/ Rationale** | **Reviewer (Name/Agency)** | **Suggested Disposition** | **Final Disposition****(Do Not Fill In)** |
| 1 | 1-1 | 1.1 | 1 | N/A | ed, te | A natural question to ask for someone looking at this document for the first time might be "What is meant by the term 'Navigation Hardware'?" | David Berry / NASA/JPL | This term is defined in section 1.6.1, but it might be worth repeating the operational definition here, OR pointing the reader to section 1.6.1. |  |
| 2 | 1-1 | 1.1 | 2 | 6-7 | ed | There appears to be a superfluous word "data" at the end of the sentence: "The data is then used to monitor and analyze performance of the hardware and of the spacecraft use of the hardware data." | David Berry / NASA/JPL | Consider editingFrom: "...use of the hardware data."To: "...use of the hardware." |  |
| 3 | 1-1 | 1.1 | 2, 3 | All | ed | I think this material might be better for Section 2 of the document. | David Berry / NASA/JPL | Consider moving these 2 paragraphs to Section 2.  |  |
| 4 | 1-2 | 1.5 | First 5 | All | ed | I can't help but wonder if a more natural arrangement might be to have KVN structure and syntax as contiguous sections, followed by XML structure and syntax | David Berry / NASA/JPL | Consider re-ordering current Section 5 as Section 4 and current Section 4 as Section 5 ... Suggest discussion at London meetings. |  |
| 5 | 1-3 | 1.5 | 2 | 1 | ed | Says "Annex C discusses Security...", but it's actually Annex B. | David Berry / NASA/JPL | From: Annex CTo: Annex BALTERNATIVELY... we need to insert a normative annex after Annex A to include the Implementation Conformance Specification (ICS) annex, now required by the CCSDS procedures. If that annex is included, then the pointer to Annex C would be correct. |  |
| 6 | 1-3 | 1.5 | 3,4 | 1 | ed | There are 2 descriptions of Annex D. | David Berry / NASA/JPL | Correct the error, but take into account previous comment and need to include a normative annex after the existing Annex A. |  |
| 7 | 1-3 | 1.5 | 6 | 1 | ed | Both Annexes F and G are described on the same line. | David Berry / NASA/JPL | Insert a line/paragraph break after the description of Annex F. |  |
| 8 | 1-3 | 1.5 | 8 | 1 | ed | Note that the graphical representation referred appears to be "broken". | David Berry / NASA/JPL | Confirm that graphic appears in the MS Word version of the document (this could be a Mac/PC incompatibility problem because it looks like there is a space for the graphic in the MS Word version, but there is a big red "X" and a message "The image part with relationship ID rld21 was not found in the file." |  |
| 9 | 1-3 | 1.5 | 9 | N/A | te | In the ADM and ODM, the normative sections for TIME\_SYSTEM and REF\_FRAME are combined in one normative annex. A separate annex J for the reference frame is a departure from this convention. | David Berry / NASA/JPL | Suggest combining the TIME\_SYSTEM and reference frame information in a single normative annex. At any rate, CCSDS publications are supposed to have all normative annexes before the first informative annex, so at the very least Annex J will need to move to be Annex B or C. |  |
| 10 | 1-3 | 1.5 | N/A | N/A | te | There is no ICS (Implementation Conformance Specification) annex | David Berry / NASA/JPL | Add a space for the annex. We can populate much of it later. Some boilerplate can be borrowed from the CDM. |  |
| 11 | 1-3 | 1.6 | 1 | 2 | ed, te | Annex designation for the informative reference is not correct; also, there is a second reference that should be added. | David Berry / NASA/JPL | From: "... reference [F2]"To: "... references [G2], [G3]." or "...reference [G2] and reference [G3]." |  |
| 12 | 1-3 | 1.6.1 | 3 | All | ed, te | Definition of KVN seems a bit backward | David Berry / NASA/JPL | Suggested possible definition: denotes a format which associates a value with a keyword. The keyword designates an important property or attribute of the subject under discussion, and the value represents a measurement or descriptive state of that property. |  |
| 13 | 1-4 | 1.6.3 | 4 | 3 | ed | Typo | David Berry / NASA/JPL | From: "... acharacter string..."To: "... a character string..." |  |
| 14 | 1-4 | 1.6.3 | 5 | All | ed | Paragraph that starts with "Additional definitions..." seems superfluous given that there don't seem to be any additional terms defined in section 2.2 | David Berry / NASA/JPL | Consider deleting paragraph. |  |
| 15 | 1-5 | 1.7 | [3] | 1 | ed | Typo | David Berry / NASA/JPL | From: "... Internationaldes..."To: "... International des..." |  |
| 16 | 1-5 | 1.7 | [8] | All | te | I believe the Spacewarn Bulletin is obsolete at this point (?). In the CDM we referred to INTERNATIONAL\_DESIGNATORs without specifying where to find them, but a good source is the UN Register of Space Objects.  | David Berry / NASA/JPL | Consider using a reference to the UN Register of Space Objects... we should maybe discuss this at London. |  |
| 17 | 2-1 | 2.2.3 | 1 | All | ed | By the time we get to this paragraph, it's well established that the format is ASCII. It's a bit anti-climactic to restate that in the 3rd paragraph. I think this paragraph would be best as Section 2.2.1 instead of 2.2.3. | David Berry / NASA/JPL | Consider moving existing 2.2.3 to 2.2.1 |  |
| 18 | 3.1 | 3.1.8 | N/A | N/A | ed | The general guideline on filename syntax would presumably be covered between the relevant agencies’ ICD, unless a specified universal standard is being suggested? | Andrew Woodcock / Honeywell | Consider removing second sentence. |  |
| 19 | 3.2  | 3.2.4 | N/A | N/A | ed | Table 1, description in ‘Comment’ row refers reader to See 0.  | Andrew Woodcock / Honeywell | Update reference |  |
| 20 | 3.4  | 3.3.5 | N/A | N/A | ed | Table 2, description in ‘Comment’ row refers reader to See 0.  | Andrew Woodcock / Honeywell | Update reference |  |
| 21 | 3-1 | 3.1 | All | All | ed | This section starts with "GENERAL", and section 4 starts with "DISCUSSION". Maybe they should use the same header, since they are both non-normative. | David Berry / NASA/JPL | Consider. |  |
| 22 | 3-1 | 3.1.3 | 1 | 2 | ed | Refers reader to section 0 | David Berry / NASA/JPL | Fix reference |  |
| 23 | 3-1 | 3.1.4 | 1 | 1-2 | ed, te | States that there will be one metadata section and one data section in an NHM, but this may not be the best structure. | David Berry / NASA/JPL | We should discuss at London if one big undifferentiated Data Section is the best structure for the NHM. |  |
| 24 | 3-1 | 3.1.6 | 1 | 1-2 | ed | The first and second sentences are redundant. NHM may not be "easily readable by humans". | David Berry / NASA/JPL | Remove redundant sentence. Decide whether easy readability by humans is really a requirement. This may be a topic for discussion at London. |  |
| 25 | 3-1 | 3.1.6 | N/A | N/A | ed | Duplication of “…easily readable…” | Andrew Woodcock / Honeywell | Remove second sentence. |  |
| 26 | 3-1 | 3.1.8 | 1 | 4 | te | Mentions "...processing tracking data", which should probably be "...processing telemetry data" | David Berry / NASA/JPL | From: processing tracking dataTo: processing telemetry data |  |
| 27 | 3-1 | 3.2.1(c) | 1 | 1 | ed | Here the term "Navigation Data Records" is used, and the reader is referred to section 3.4. In 3.4, the term "Hardware Data Records" is used. | David Berry / NASA/JPL | Be consistent with terminology (probably "Hardware Data Records") |  |
| 28 | 3-2 | 3.2.4 | 1 | 1 | ed | Use of indefinite article | David Berry / NASA/JPL | From: "a NHM Header" To: "an NHM Header"NOTE: I conferred with the CCSDS Editor on this item. |  |
| 29 | 3-2 | 3.2.6.1 | N/A | N/A | ed | Redundancy? This repeats the instruction in Table 1 of the same page | Andrew Woodcock / Honeywell | Consider removing one instance of the instruction? |  |
| 30 | 3-2 | Table 3-1 | COMMENT |  | ed | Refers reader to "0" | David Berry / NASA/JPL | Correct reference |  |
| 31 | 3-2 | Table 3-1 | ORIGINATOR |  | ed, te | Instead of referring user to an ICD, should we refer them to the SANA registry (as was done for CDM)? | David Berry / NASA/JPL | Discuss at London. |  |
| 32 | 3-3 | 3.3.4.5 | 1 | All | ed, te | This specification is superfluous given 3.3.6 | David Berry / NASA/JPL | Remove 3.3.4.5 |  |
| 33 | 3-4 | 3.3.6 | 1 | 1 | ed | Use of indefinite article | David Berry / NASA/JPL | From: "a NHM Metadata Section" To: "an NHM Metadata Section "NOTE: I conferred with the CCSDS Editor on this item. |  |
| 34 | 3-4 | Table 3-2 | COMMENT |  | ed | Refers reader to "0" | David Berry / NASA/JPL | Correct reference |  |
| 35 | 3-4 | Table 3-2 | COMMENT |  | ed, te | Allowing comments "anywhere after META\_START and before META\_STOP" is problematic.  | David Berry / NASA/JPL | Comments in Metadata should only be allowed immediately after META\_START or in the proper place in the DEFINE block. Doing otherwise unnecessarily complicates and clutters up the XML schema, as well as causing a situation where the schema will not validate. This is easier to show you than to explain, but basically if you want comments anywhere in the metadata then you have to make EVERY keyword in Table 3-2 obligatory (it has to do with the ambiguities in the XML). |  |
| 36 | 3-5 | 3.4.2 | N/A | N/A | ed | Requirement uses ‘must’ rather than ‘shall’  |  | Word switch from ‘must’ to ‘shall’ (also 3.4.8) |  |
| 37 | 3-5 | Table 3-2 | DEFINE |  | ed, te | Using a DEFINE keyword here instead of MNEMONIC causes some inconsistency with the construction of the XML message. | David Berry / NASA/JPL | We should discuss at London. I think the older MNEMONIC keyword was better here (instead of DEFINE). It occurs to me it might be best to have "DEFINE = <text describing the instrument, that now appears in a COMMENT>", followed by the applicable "MNEMONIC = ...", "FRAME = ...", and "CALCURVE =..." statements. Might be cleaner, e.g.:DEFINE=Three axis magnetometerMNEMONIC=ACS.TAM1.FIELD.V4.I3BFRAME=SENSORCALCURVE=-301.5 0.00724DEFINE=<next instrument>... |  |
| 38 | 3-5 | Table 3-2 | OBJECT\_ID |  | ed | Typo. The typo starts on one line and ends on the following line... there is a dash at the end of the first line that should be at the beginning of the second line. | David Berry / NASA/JPL | From: "...where:-From: "YYYY ="To: "...where:"To: "- YYYY =" |  |
| 39 | 3-6 | 3.4.4 | N/A | N/A | ed | Requirement missing auxiliary verb  |  | Add ‘shall’ (…shall consist of…) |  |
| 40 | 3-6 | 3.4.5 | N/A | N/A | ed | ‘Element’ columns in Tables 3, 4 missing border |  | Realign ‘Element’ columns in Tables 3, 4  |  |
| 41 | 3-6 | Table 3-2 | CALCURVE | 4-7 | te | The description of CALCURVE states that it is used to convert units from one type to another. However, neither the source nor the target unit type is specified. | David Berry / NASA/JPL | Discuss CALCURVE concept at London... since units are not specified in the NHM, we need some way to understand the from and the to units. Is this specified in the ICD? If so, then state it. |  |
| 42 | 3-6 | Table 3-2 | CALCURVE | 4-7 | te | Is having the zeroth order as the first coefficient a standard form? Normally when one sees the expansion with coefficients one sees the nth order first, however, if one uses the summation (sigma) notation, the zeroth order would be first. | David Berry / NASA/JPL | Discuss format at London. |  |
| 43 | 3-6 | Table 3-2 | CALCURVE | 4-7 | te | For parsing purposes, should the number of coefficients be provided (similar to the concept of the value count field)? | David Berry / NASA/JPL | Discuss format at London. |  |
| 44 | 3-6 | Table 3-2 | FRAME | 7 | ed | Typo | David Berry / NASA/JPL | From: "msut"To: "must" |  |
| 45 | 3-6 | Table 3-2 | FRAME | last sentence | ed | The statement regarding "... must come after the line..." etc. is superfluous. There is already a statement at beginning of Table 3-2 fixing the order. There are no other analogous statements in Table 3-2 | David Berry / NASA/JPL | Remove last sentence. |  |
| 46 | 3-6 | Table 3-2 | FRAME | N/A | te | I am wondering how it will be communicated to the users of the data exactly which EXTERNAL frame applies (if EXTERNAL is used). For BODY and SENSOR it seems fairly obvious, but for EXTERNAL it is not. | David Berry / NASA/JPL | Discuss at London. |  |
| 47 | 3-7 | 3.4.3, 3.4.4 | All | All | ed, te | I think that the "Fixed" and "Variable" Data Record is overkill here. It really harks back to "the good old days" in computer programming. DATA\_START, DATA\_STOP, and COMMENT can't really be considered "Data Records". Properly, DATA\_START and DATA\_STOP are delimiters. COMMENTs are just comments... they aren't meant to convey operationally useful data (at least not in the standard itself... some users may choose to codify operational data in ICDs, but that is beyond the scope of the standard). | David Berry / NASA/JPL | Consider eliminating the distinction between "fixed" and "variable" Data Records. It is a needless complication. |  |
| 48 | 3-7 | 3.4.5 | 1 | 1 | ed, te | Remove "Variable" from the specification. | David Berry / NASA/JPL | See previous comment about fixed/variable data records. |  |
| 49 | 3-7 | 3.4.5 | NOTE |  | ed, te | Remove fixed/variable data record distinction. | David Berry / NASA/JPL | From: "NOTE - More detail on the format of Fixed Hardware Data Record is shown in table 3-3 and more detail on the format of Variable Data Records is shown in Table 3-4.."To: "NOTE - More detail on the format of Hardware Data Records is shown in Table 3-3." |  |
| 50 | 3-7 | Table 3-3 | All | All | ed, te | The table on "Fixed Data Record Format" is superfluous. | David Berry / NASA/JPL | Remove Table 3-3 |  |
| 51 | 3-8 | 3.4.10.2 | 1 | 2 | ed, te | We should be careful for KVN about stating that there is a number of values greater than 1. In the case of the NHM, there is one multi-partite value. See section 5.2.7. | David Berry / NASA/JPL | Let's discuss at London. Perhaps "Value Count" should be "Measurement Count". |  |
| 52 | 3-8 | 3.4.10.2 | 1 | 2 | ed, te | There is a phrase at the end of 3.4.10 that might be good here, specifically, "... as defined for the record's mnemonic in the Metadata Section.". | David Berry / NASA/JPL | Consider adding the phrase "... as defined for the record's mnemonic in the Metadata Section." at the end of this specification. |  |
| 53 | 3-8 | 3.4.10.4 | 1 | All | te | I think this specification is unnecessary (it should be clear from other material in the standard), but if you feel it is necessary, then the verb should be "must" or "shall", not "may". | David Berry / NASA/JPL | Either: (a) delete this specification, or (b) change "may" to "must" or "shall". There is no provision for multiple timetags in a single Hardware Data Record. |  |
| 54 | 3-8 | 3.4.11 | 1 | 1 | te | The requirement for ascending time order is not consistent with the Tracking Data Message. Though I understand why one might want such a requirement, we should discuss (e.g., some providers might want the data for each mnemonic to be in ascending time order, which means that at the boundary between two mnemonics there is a high probability of violating this specification. | David Berry / NASA/JPL | Consider whether a strict ordering is a true requirement. Discuss at London. |  |
| 55 | 3-8 | 3.4.12 | 1 | 1 | te | DATA\_STOP is not a "Hardware Data Record". This specification is superfluous. | David Berry / NASA/JPL | Remove 3.4.12. |  |
| 56 | 3-8 | 3.4.9 | 1 | 1-2 | ed | Several recommended changes. | David Berry / NASA/JPL | From: "... containing keywords other than those specified in the MetaData Section shall not be processed."To: "... containing a keyword not specified in the Metadata Section shall not be processed." |  |
| 57 | 3-8 | 3.4.9 | NOTE | 1 | ed | Consistency | David Berry / NASA/JPL | From: MetaDataTo: Metadata |  |
| 58 | 404 | 4.4.6.4 | 1 | 1 | ed, te | Consistency | David Berry / NASA/JPL | From: "...required Define Keyword..."To: "... required DEFINE keyword..." |  |
| 59 | 4-1 | 4.2.2 | 1 | 2 | ed | Unnecessary reiteration of "KVN" | David Berry / NASA/JPL | From: "... correspondence between KVN keywords in the KVN and XML implementations..."To: "... correspondence between keywords in the KVN and tags in the XML implementations..." |  |
| 60 | 4-1 | 4.2.2 | 1 | 3 | ed | Clarification... | David Berry / NASA/JPL | From: "The 'CCSDS\_NHM\_VERS' shall appear as XML attributes rather than as XML elements."To: " The 'CCSDS\_NHM\_VERS' keyword and its value shall appear as XML attributes rather than an XML element." |  |
| 61 | 4-1 | 4.2.3 | 1 | 3 | ed | Typo... sentence lacks a period. | David Berry / NASA/JPL | End sentence with a period. |  |
| 62 | 4-1 | 4.2.4 | 1 | 2 | ed | Suggestion. | David Berry / NASA/JPL | Add "<defineSet>" to "<header>, <segment>"  |  |
| 63 | 4-1 | 4.3 | All | All | ed | Logically I think this section should precede what is now numbered as 4.2 | David Berry / NASA/JPL | Consider moving the section. |  |
| 64 | 4-1 4-2 | 4.3 | Fig 4-1 | N/A | ed | Figure breaks over the two pages. | David Berry / NASA/JPL | Add blank lines at bottom of 4-1 or a page break to get the figure all on one page. |  |
| 65 | 4-2 | 4.4 | Title | N/A | ed | Use of indefinite article | David Berry / NASA/JPL | From: "A NHM/XML" To: "An NHM/XML"NOTE: I conferred with the CCSDS Editor on this item and the following item. |  |
| 66 | 4-2 | 4.4.3.1 | 1 | 1 | ed | Use of indefinite article | David Berry / NASA/JPL | From: "A NHM instantiation..." To: "An NHM instantiation..." |  |
| 67 | 4-3 | 4.4.3.44.4.3.5 | All | All | ed | Placement of these two sections. I think the material in these two sections really doesn't belong with "BEGINNING THE INSTANTIATION..." | David Berry / NASA/JPL | Consider moving them to a new Section 4.2, or at the end of Chapter 4 (section 4.5). |  |
| 68 | 4-3 | 4.4.3.7 | 1, 2 | 1 | ed | The two lines in these paragraphs don't need to be separated. | David Berry / NASA/JPL | Suggest moving "The 'version'..." immediately following the first sentence in 4.4.3.7. |  |
| 69 | 4-4 | 4.4.6.1 | 1 | 1 | ed | Typo. | David Berry / NASA/JPL | From: "Data SectionMetadata Section..."To: "Metadata Section..." |  |
| 70 | 4-4 | 4.4.6.3 | 1 | 1-2 | te | I think the statement as written is not quite accurate. | David Berry / NASA/JPL | From: existing textTo: Each NHM/XML Metadata Section shall include at least one <defineSet></defineSet> construct which is used to provide a set of descriptive information about an instrument in the Data Section. |  |
| 71 | 4-4 | 4.4.6.3 | 1 | 3,4 | te | The XML example is part of the XML schema language (which users wouldn't write), but should be part of the instantiation. (NOTE: I missed this in my prior quick review... sorry!) | David Berry / NASA/JPL | Delete the "<xsd:element... />. Not really necessary here. |  |
| 72 | 4-4 | 4.4.6.4 | 2 | All | ed, te | This XML example is part of the XML schema language, which users wouldn't write. (NOTE: I missed this in my prior quick review of the text in this section... sorry!) | David Berry / NASA/JPL | From: existing.To: <defineSet> <DEFINE>mnemonic</DEFINE> <COMMENT>text</COMMENT> <FRAME>SENSOR</FRAME> <CALCURVE>0 2.5</CALCURVE></defineSet>In the example you can fill in an appropriate mnemonic keyword and comment. |  |
| 73 | 4-5 | 4.4.7 | 1 | 1 | ed | Typo. | David Berry / NASA/JPL | From: "Data SectionMetadata Section..."To: "Metadata Section..." |  |
| 74 | 4-5 | 4.4.7 | 3 | 2 | ed | Sentence appears to end with a colon due to the fact that the Figure referred to is on the next page. | David Berry / NASA/JPL | From: "...figure 4-2:"To: "...figure 4-2." |  |
| 75 | 4-5 | 4.4.7 | 3 | All | ed, te | I think the statement as written is not quite accurate. | David Berry / NASA/JPL | From: existing textTo: Each NHM/XML Data Section shall include at least one <hardwareDataRecord></hardwareDataRecord> construct which is used to provide a set of measurements from one of the instruments described in the Metadata Section. |  |
| 76 | 4-6 | Figure 4-2 | Part 1 |  | ed, te | There is a subtlety in the keywords of the <hardwareDataRecord> that will be easier to discuss at the face-to-face, but basically, due to the statement in Section 4.2.1, I think the <MNEMONIC> tag should be <mnemonic>, and the <EPOCH> tag should be <epoch>. | David Berry / NASA/JPL | Schedule for discussion at London. |  |
| 77 | 4-7 | Table 4-1 | <defineSet> | Definition | ed, te | States that the <defineSet> **defines** comments, but it does not, though it may **contain** them. | David Berry / NASA/JPL | From: "Defines a Mnemonic Keyword, optional descriptive comments, an ..."To: "Defines a Mnemonic Keyword, a reference frame, and a calibration curve. May also include descriptive comments." |  |
| 78 | 5-1 | 5.1.1 | 1 | 1 | ed | Typo – 5.2 through 0, | Patrick Zimmerman / NASA/JSC | should be 5.2 through 5.8 |  |
| 79 | 5-1 | 5.1.1 | 1 | 1 | ed | Section number error | David Berry / NASA/JPL | From: "5.2 through 0"To: "5.2 through 5.8 |  |
| 80 | 5-1 | 5.2.10 | 1 | All | ed | Should be a sub-bullet to 5.2.9, which is currently left dangling with a : | Patrick Zimmerman / NASA/JSC | 5.2.10 should be a sub-bullet of 5.2.9, similar to 4.2.5 in the TDM BlueBook |  |
| 81 | 5-1 | 5.2.10 | 1 | 3 | ed | The last sentence "Before and after... " is redundant with specification 5.2.15. | David Berry / NASA/JPL | Remove last sentence from this specification |  |
| 82 | 5-1 | 5.2.11 | 1 | All | ed | Should be a sub-bullet to 5.2.9, which is currently left dangling with a : | Patrick Zimmerman / NASA/JSC | 5.2.11 should be a sub-bullet of 5.2.9, similar to 4.2.5 in the TDM BlueBook |  |
| 83 | 5-1 | 5.2.4 | 1 | 1 | ed | Grammar | David Berry / NASA/JPL | From: "A NHM..."To: "An NHM..." |  |
| 84 | 5-1 | 5.2.7 | 1 | 1 | ed | Grammar | David Berry / NASA/JPL | From: "A NHM..."To: "An NHM..." |  |
| 85 | 5-1 | All section 5 | 1 | 1 | te | I wonder if we should use the word “record” when in 3.1.1 we describe the NHM as being ASCII text “lines” in 3.1.1. | David Berry / NASA/JPL | From: "record, “records”To: "line", “lines” |  |
| 86 | 5-2 | 5.2.13.4 | 1 | All | ed | Clarification of words | Patrick Zimmerman / NASA/JSC | The timetag and measurements/calculated values in the value terms must be separated byat least one blank character (white space). |  |
| 87 | 5-2 | 5.2.13.4.1 | 1 | All | ed | Should be a sub-bullet to 5.2.9, which is currently left dangling with a : | Patrick Zimmerman / NASA/JSC | 5.2.13.4.1 should be a sub-bullet of 5.2.9, similar to 4.2.5 in the TDM BlueBook. These exceptions are needed followup to the words in 5.2.10 and 5.2.11 |  |
| 88 | 5-2 | 5.3 | all | all | ed | ‘Value’ appears to be an overloaded term throughout section 5.3, as it can refer to both the keyword and the value of the keyword-value pair. Distinction should be made when referring to the Keyword itself. | Patrick Zimmerman / NASA/JSC | Use a different term other than ‘value’ when referring to the keyword, such as ‘designator’5.3 NHM MNEMONIC KEYWORD DESIGNATORS5.3.1 The designators associated with the “DEFINE” keyword…etc. |  |
| 89 | 5-3 | 5.3.1.10 | 1 | 1 | ed | Additional definition of what goes into this field is lacking (doesn’t match Table 5-1) | Patrick Zimmerman / NASA/JSC | The value contained in the Data Group Field shall be one specified in an ICD. |  |
| 90 | 5-3 | 5.3.1.11 | 1 |  | ed | The length of the data group field is not specified... is it truly "arbitrary"? or should it be constrained to some reasonable value (e.g., no more than 10 characters, or something like that)? | David Berry / NASA/JPL | Consider adding information about the length of the field. |  |
| 91 | 5-3 | 5.3.1.11 | All | All | ed | Should be sub-bullets of 5.3.1.5 Data Group Field | Patrick Zimmerman / NASA/JSC | Make 5.3.4.1 |  |
| 92 | 5-3 | 5.3.1.12 | Title | 1 | ed, te | In KVN, normally we say there is one value for each keyword. In the case of the NHM, the "value" is multipartite... a timetag + some number of measurements. I think a better name for this field would be "Measurement Count Field" or "Data Count Field". Personally I prefer "Measurement..." | David Berry / NASA/JPL | From: "Value Count Field"To: "Measurement Count Field" or "Data Count Field". |  |
| 93 | 5-3 | 5.3.1.13 | 1 | 1-2 | ed, te | Lacks focus on the definition of the Mnemonic Keyword. | David Berry / NASA/JPL | From: "The fourth field of a Mnemonic Keyword shall ..."To: " The fourth field of a Mnemonic Keyword definition shall ..." |  |
| 94 | 5-3 | 5.3.1.13 | 1 | 1-2 | ed, te | Could improve economy of terminology | David Berry / NASA/JPL | From: "... number of data items (in addition to timetag) that will appear..."To: "... number of measurements that will appear..." |  |
| 95 | 5-3 | 5.3.1.13 | 1 | 2 | ed, te | Use previously defined term (i.e., "Hardware Data Record") | David Berry / NASA/JPL | From: "... in each record of the Data Section that begins with the Mnemonic Keyword."To: "... in each Hardware Data Record that begins with the given Mnemonic Keyword." |  |
| 96 | 5-3 | 5.3.1.13 | All | All | ed | Should be sub-bullets of 5.3.1.6 Value Count Field | Patrick Zimmerman / NASA/JSC | Make 5.3.5.1 |  |
| 97 | 5-3 | 5.3.1.15, 5.3.1.16 | All | All | ed | Both should be sub-bullets of 5.3.1.7 Data Type Field | Patrick Zimmerman / NASA/JSC | Make 5.3.6.1, 5.3.6.2 |  |
| 98 | 5-3 | 5.3.1.2 | 1 | 3 | ed | Missing comma/clarification | Patrick Zimmerman / NASA/JSC | (ASCII value 46, aka decimal). |  |
| 99 | 5-3 | 5.3.1.2 | 1  | 1 | ed | The terms "Mnemonic Keyword(s)" and "Mnemonic(s)" are used interchangeably. | David Berry / NASA/JPL | Specify that the two terms are equivalent...From: "The Mnemonic Keyword shall be an alphanumeric string..."To: "The Mnemonic Keyword (aka "Mnemonic" in the singular and "Mnemonics" in the plural) shall be an alphanumeric string..." |  |
| 100 | 5-3 | 5.3.1.2 | 1 | 2 | ed | There is no space after the period between sentence 1 and sentence 2. | David Berry / NASA/JPL | Add a space after the period between sentence 1 and sentence 2. |  |
| 101 | 5-3 | 5.3.1.4 | 1 | 2 | ed | Wording inconsistent with other field definition statements | Patrick Zimmerman / NASA/JSC | The first field of a Mnemonic shall specify the spacecraft system from which the data originates. |  |
| 102 | 5-3 | 5.3.1.4, 5.3.1.5, 5.3.1.6 | All | All | ed | All three should be sub-bullets of 5.3.1.3 | Patrick Zimmerman / NASA/JSC | Make 5.3.2.1, 5.3.2.2,5.3.2.3 |  |
| 103 | 5-3 | 5.3.1.5 | 1 | 1 | ed, te | Doesn't state the size of the string. All the examples show 3 characters, except "PWRR" in Table C-1 | David Berry / NASA/JPL | From: "...shall consist of an alphanumeric string."To: "... shall consist of a 3 character alphanumeric string."Alternatively: Put this 3 character limitation into Table 5-1 (as was done with Hardware Type) |  |
| 104 | 5-3 | 5.3.1.5 NOTE, 5.3.1.9 NOTE, 5.3.1.16 NOTE | 1 | 1 | ed | Awkward phrasing, suggest re-wording | Patrick Zimmerman / NASA/JSC | An ICD should be used only if the appropriate designator is not in the SANA registry. In that event, if the designator is not considered unique, addition of the designator to the SANA registry is preferred. |  |
| 105 | 5-3 | 5.3.1.5 NOTE, 5.3.1.9 NOTE, 5.3.1.16 NOTE | 1 | 1 | ed | Typo, missing dash | Patrick Zimmerman / NASA/JSC | Add DashNOTE – An ICD… |  |
| 106 | 5-3 | 5.3.1.8, 5.3.1.9 | All | All | ed | Both should be sub-bullets of 5.3.1.4 Hardware Type Field | Patrick Zimmerman / NASA/JSC | Make 5.3.3.1, 5.3.3.2 |  |
| 107 | 5-3 | Between 5.3.1.2 &5.3.1.3 | N/A | N/A | ed, te | I wonder if between 5.3.1.2 and 5.3.1.3 would be a good place to put the Table 5-1 (?) | David Berry / NASA/JPL | Consider. |  |
| 108 | 5-3 to 5-4 | 5.3.1.3, 5.3.1.7, 5.3.1.10, 5.3.1.12, 5.3.1.14 | 1 | 1 | ed | Main bullets need to be re-numbered, with the other entries becoming sub-bullets | Patrick Zimmerman / NASA/JSC | 5.3.2 System Field5.3.3 Hardware Type Field 5.3.4 Data Group Field5.3.5 Value Count Field5.3.6 Data Type Field |  |
| 109 | 5-3, 5-4,5-7 | 5.3.1.6,5.3.1.9,5.3.1.16,5.5 | 1 | 1 | ed | Incorrect Annex referenced for the SANA registry. | Patrick Zimmerman / NASA/JSC | Change to Annex B |  |
| 110 | 5-4 | 5.3.1.13 | 1 | 1 | ed, te | Change terminology from "Value Count" to "Measurement Count" | David Berry / NASA/JPL | From: "This field is referred to as the Value Count field."To: "This field is referred to as the Measurement Count field." |  |
| 111 | 5-4 | 5.3.1.15 | 1 | 1 | ed | Rewording for consistency with other Field definitions | Patrick Zimmerman / NASA/JSC | The fifth field of a Mnemonic Keyword may optionally specify the form of the data associated with the Mnemonic Keyword. |  |
| 112 | 5-4 | Table 5-1 | n/a | n/a | ed | Incomplete description of HARDWARE TYPE field | Patrick Zimmerman / NASA/JSC | The hardware type field shall start with an upper case alphabetic string containing exactly three characters, followed by the numeric value of the hardware instance. |  |
| 113 | 5-4, 5-5 | Table 5-1 | n/a | n/a | ed | Incorrect Annex referenced. | Patrick Zimmerman / NASA/JSC | Change to Annex B, in System, Hardware and Data Descriptions |  |
| 114 | 5-5 | 5.4 | Missing | N/A | ed | A statement analogous to 6.3.1 should be present, but is not. | David Berry / NASA/JPL | Add statement analogous to 6.3.1. |  |
| 115 | 5-5 | 5.4.1 | 1 | 1 | ed, te |  | David Berry / NASA/JPL | From: "Non-empty value fields must..."To: "A non-empty value must ..." |  |
| 116 | 5-5 | 5.4.2 | 1 | 1 | ed | Missing word | Patrick Zimmerman / NASA/JSC | The number of values for each Mnemonic provided must equal the number in the “Value Count” field of the Mnemonic Keyword. |  |
| 117 | 5-5 | 5.4.2 | 1 | 1 | te | For KVN there is only one value for each keyword, but the value may have structure and be made up of multiple elements, components, or measurements. | David Berry / NASA/JPL | From: "The number of values for each Mnemonic Keyword provided must equal the number in the 'Value Count' field of the Mnemonic."To: "The number of measurements for each Mnemonic Keyword provided must equal the number in the 'Measurement Count' field of the Mnemonic." |  |
| 118 | 5-5 | 5.4.3 | 1 | 1 | ed | Indicates a “Data Format” field, which does not exist, should be “Data Type”. Rest of sentence is awkward/redundant | Patrick Zimmerman / NASA/JSC | If the “Data Type” field exists in the Mnemonic Keyword, the values provided must match that format. |  |
| 119 | 5-5 | 5.4.3 | 1 | 1 | ed | Word substitution. | David Berry / NASA/JPL | From: "... the format of the value fields for each Mnemonic Keyword..."To: "... the format of the measurements for each Mnemonic Keyword..." |  |
| 120 | 5-5 | Table 5-1 | Field, Value Count | 1 | ed, te | In the "Field" column the term "Measurement Count" should be substituted. | David Berry / NASA/JPL | From: "VALUE COUNT [ELEMENT COUNT?]" To: "MEASUREMENT COUNT" |  |
| 121 | 5-5 | Table 5-1 | Field, Value Count | 1 | ed, te | In the "Description" column the term "measurement count" should be substituted for "value count". | David Berry / NASA/JPL | From: "... value count field..."To: "...measurement count field..." |  |
| 122 | 5-5 | Table 5-1 | n/a | n/a | ed | In the VALUE COUNT Field column entry, remove unneeded text | Patrick Zimmerman / NASA/JSC | Delete (ELEMENT COUNT?) from Field column |  |
| 123 | 5-5 | Table 5-1 | n/a | n/a | ed | In the VALUE COUNT description, replace ‘elements’ with ‘values’. The word element in not used elsewhere, and appears non-specific | Patrick Zimmerman / NASA/JSC | The value count field shall be a string consisting of the upper case letter “V” followed by an integer that indicates the number of data values on each data record with this string as its Mnemonic Keyword. |  |
| 124 | 5-5 | Table 5-1, Data Type | Description | 1 | ed | Word substitution | David Berry / NASA/JPL | From: "The data format shall..."To: "The data type shall..." |  |
| 125 | 5-5 | Table 5-1, Data Type | Description | 2-3 | ed | Consistency | David Berry / NASA/JPL | From: "... for each of the elements"To: "... for each of the measurements" |  |
| 126 | 5-5 | Table 5-1, Data Type | Description | 4-5 | ed, te | In the "Description" column the term "MEASUREMENT COUNT" should be substituted for "VALUE COUNT". | David Berry / NASA/JPL | From: "... VALUE COUNT ..."To: "...MEASUREMENT COUNT ..." |  |
| 127 | 5-5, 5-6 | 5.4.5, 5.4.7 | 1 | 1 | ed, te | Term ‘exponential notation’ is inconsistent with other NAV documents, and with 5.4.7.4. Use floating-point instead | Patrick Zimmerman / NASA/JSC | floating-point notation |  |
| 128 | 5-6 | 5.4.7.4 | 1 | 1 | ed | The minus sign is not ascii character 43, it’s 45 | Patrick Zimmerman / NASA/JSC | The exponent must be an integer, and must have a ‘+’ sign (ASCII Character 43), a ‘-’ sign (ASCII Character 45) or neither. If the sign is omitted, then ‘+’ is assumed). |  |
| 129 | 5-6 | 5.4.7.4 | 1 | 1-2 | ed, te | Error in ASCII character assignments. Both "+" and "-" are stated as being "ASCII Character 43". | David Berry / NASA/JPL | Either: (1) put the correct ASCII codes, or (2) remove the ASCII character information.  |  |
| 130 | 5-6 | 5.4.7.4 NOTE | 1 | 1 | ed | The 2nd NOTE indicates a reference 6, which doesn’t appear to exist | Patrick Zimmerman / NASA/JSC | Verify references and update citations |  |
| 131 | 5-6 | 5.4.7.4 Note: | 1 | 1 | ed | There are 2 NOTES for 5.4.7.4. Suggest changing Note: 1 into 5.4.7.5 | Patrick Zimmerman / NASA/JSC | 5.4.7.5 The maximum positive floating-point value is approximately 1.798E+308, with 16 significant decimal digits precision. The minimum positive floating-point value is approximately 4.94E-324, with 16 significant decimal digits precision. |  |
| 132 | 5-6 | 5.4.9 | 1 | 1 | ed | Character value Fields is a header and should be in bold | Patrick Zimmerman / NASA/JSC | 5.4.9 Character value fields |  |
| 133 | 5-6 | 5.4.9 | 1 | 1 | ed | Looks like it's supposed to be a header (since it's an incomplete sentence), but the font seems to be incorrect. | David Berry / NASA/JPL | Correct the font type (or line type) so it's clear it is a heading. |  |
| 134 | 5-6 | 5.4.9.3 | 1 | 1 | ed | Should characters start with an opening single quote symbol instead? (ascii character 96)  | Patrick Zimmerman / NASA/JSC | Confirm symbols for indicating character fields |  |
| 135 | 5-6 | 5.4.9.3 | 1 | 1 | ed, te | Having character fields start/end with a quote will be problematic.  | David Berry / NASA/JPL | Must discuss at London. Questions:1. Is a mnemonic keyword in the metadata section DEFINE statement a "character value"? I think yes.2. Why aren't the text values in the example (Annex E) in quotes? (There are MANY instances of character values NOT in quotes). |  |
| 136 | 5-7 | 5.4.10 | 1 | 1 | te | The meaning of "0" and "1" is not defined, but should be. | David Berry / NASA/JPL | For this standard, the meaning of zero should always be the same... either always "false" or "bad" or "error", or always "true" or "good" or "no error". If the actual binary flags on the instrument are OPPOSITE this, then the program that takes the telemetry data and formats the NHM should make the conversion so in the STANDARD, 0/1 always have the same value. 5.4.10 should enlarge on this topic. Table C-1 in Annex C has similar info in the units column, but that is non-normative. |  |
| 137 | 5-7 | 5.4.11 | 1 | 1 | ed | Believe this is redundant with 5.4.10 | Patrick Zimmerman / NASA/JSC | Delete if redundant |  |
| 138 | 5-7 | 5.4.11 | 1 | 1 | ed, te | I think the present 5.4.11 should precede the current 5.4.10. | David Berry / NASA/JPL | Current structure goes from specific to general. I think general to specific is better in this case. |  |
| 139 | 5-7 | 5.4.12 | 1 | Missing | ed, te | The instruction for fractional seconds is not provided. | David Berry / NASA/JPL | Add phrase that appears in ODM: "As many 'd' characters to the right of the period as required may be used to obtain the required precision, up to the maximum allowed for a fixed point number." |  |
| 140 | 5-7 | 5.4.12 | 5 | 3 | ed | Indicates reference 5, which does not exist | Patrick Zimmerman / NASA/JSC | Verify references and update citation |  |
| 141 | 5-7 | 5.4.9.4 | 1 | 1 | ed | Wouldn’t a single quote symbol be represented by 3 adjacent symbols, not 2? | Patrick Zimmerman / NASA/JSC | Confirm number of symbols to quote a quotation mark |  |
| 142 | 5-7 | 5.4.9.4 | 1 | 1 | ed | Sentence doesn't end with a period. | David Berry / NASA/JPL | End sentence with a period. |  |
| 143 | 5-7 | 5.4.9.4 | All | All | ed, te | I tend to feel this section isn't necessary. If it is, then there should be an example in Annex E. | David Berry / NASA/JPL | Consider removing section, OR, add a real example of data with the characteristic described in this section. |  |
| 144 | 5-7 | 5.5 | 1 | 1 | te | The Table in Annex C shows several possible units for some of the mnemonics. We need to discuss how to handle the units problem in NHMs. | David Berry / NASA/JPL | Discuss at London. |  |
| 145 | 5-8 | 5.6.2 | 2,3,4 | 1 | ed | Turn bulleted list into numbered list for consistency, as was done for the rest of section 5  | Patrick Zimmerman / NASA/JSC | 5.6.2.15.6.2.25.6.2.3 |  |
| 146 | 5-8 | 5.6.2 | 3 | 2 | ed | Make bullet 2 consistent with bullet 1 and 3, by using an “i.e.” in the sentence | Patrick Zimmerman / NASA/JSC | at the beginning of the NHM Metadata Section (i.e. between the ‘META\_START and TIME SYSTEM line, as shown in table 3-2). |  |
| 147 | 5-8 | 5.6.2 | Missing | Missing | te | One of the possible places for comments is missing from the list. | David Berry / NASA/JPL | Add that COMMENTs may appear "at the beginning of the NHM Metadata Section (i.e., immediately after the 'META\_START' keyword, as shown in Table 3-2)". |  |
| 148 | 5-8 | 5.6.5 | 1 | 1 | ed, te | Is this situation even possible since the Keywords are not defined a priori as with most other Messages? | Patrick Zimmerman / NASA/JSC | Determine if should be deleted |  |
| 149 | 5-8 | 5.7.1 | 1 | All | ed | This section seems unnecessary. There is already a statement at the beginning of Table 3-2 that states the order of occurrence of the keywords is fixed. | David Berry / NASA/JPL | Remove 5.7.1 |  |
| 150 | 5-8 | 5.7.2, 5.7.3, 5.7.4, 5.7.5 | 1111 | 11-21-21-2 | ed, te | There is only one value for the FRAME keyword, but it might consist of one or two frame specifications. | David Berry / NASA/JPL | Re-work this text to eliminate references to "two values". It is also worth considering whether or not SENSOR, BODY, EXTERNAL is complete enough, particularly in the case of EXTERNAL. Is the detail to be found in the ICD? If so, that should be stated. |  |
| 151 | 5-9 | 5.7 Notes | #3 | 1 | ed | Punctuation will help | David Berry / NASA/JPL | From: "...associated with them one of which is..."To: "...associated with them, one of which is..." (add a comma between "them" and "one". |  |
| 152 | 5-9 | 5.7 Notes | #4 | All | ed, te | We should discuss at London the content of Note 4. It is not clear to me. For example, it refers to "...the measurements represented in the corresponding define block", but the define block doesn't contain measurements... it's just definitions. What is the format of the rotation? etc. | David Berry / NASA/JPL | Discuss at London. |  |
| 153 | 5-9 | 5.7.5 | n/a | n/a | ed | Excess carriage retuns between 3 & 4 and 4 & 5 in the NOTES. | Patrick Zimmerman / NASA/JSC | Delete excess space |  |
| 154 | 5-9 | 5.8.1 | 1 | All | ed | This section seems unnecessary. There is already a statement at the beginning of Table 3-2 that states the order of occurrence of the keywords is fixed. | David Berry / NASA/JPL | Remove 5.8.1 |  |
| 155 | 5-9 | 5.8.2 | 1 | 1 | ed, te | There is only one value for the CALCURVE keyword, but it might consist of an arbitrary number of coefficients. (Actually it's not totally arbitrary, because of the 254 character line limit, but that's probably not necessary to state). | David Berry / NASA/JPL | From: "There may be an arbitrary number of values in a line..."To: "There may be an arbitrary number of coefficients in a line..." |  |
| 156 | 5-9 | 5.8.2 Notes | #1 | 1 | ed, te | Change "values" to "numbers" | David Berry / NASA/JPL | From: 'The "n" values in a line...'To: 'The "n" numbers in a line...' |  |
| 157 | 6-1 | 6.1 | 1 | 1 | ed, te | Refers to section 3, which doesn't define syntax | David Berry / NASA/JPL | From: "...shall observe the syntax described in 3.2. through 3.3." To: "... shall observe the syntax described in this chapter." |  |
| 158 | 6-2 | 6.3.4, 6.3.6 | All | All | ed | These two sections refer to text values, but they are separated by the discussion of time tag values. | David Berry / NASA/JPL | Put the two sections dealing with text values next to each other. There are several ways to accomplish this; choose your preference for order of text and time tag values. |  |
| 159 | 6-2 | 6.3.5 | 1 | 1 | ed, te | Reference to "in UTC" overly restricts the value range given in Annex A. | David Berry / NASA/JPL | From: "... a time tag in UTC, values..."To: "... a time tag, values..." |  |
| 160 | 6-2 | 6.3.5 | NOTE | All | ed, te | The use of a NOTE here is puzzling. Either both allowed formats should be described (i.e., both year/month/day and year/day of year), or neither (by referring to the formats in 5.4.12). The NOTE seems to imply that only the year/month/day is allowed. | David Berry / NASA/JPL | Consider change suggested in "Comment/Rationale". |  |
| 161 | 6-2 | 6.4 | 1 | 1 | ed, te | Seems like the <<TBD>> should be replaced by text similar to that in  | David Berry / NASA/JPL | Suggested text to replace "<<TBD>>" (similar to what's in section 5.5): " Units are not explicitly displayed in the NHM. The units associated with values in the NHM should be taken from the appropriate SANA registry (see Annex C) or defined in an ICD." |  |
| 162 | A-1 | Annex A | 2 |  |  | Not all the time system values in table 7 are in the Green Book v3.0 (reference F2). SCLK and MET are not time systems. | Juan Carlos Raymond/ NASA GSFC | Give a better description or detail for SCLK and MET. The definitions of these values may be included in the future vol. 2 of the Green Book or in this annex. |  |
| 163 | A-1 | Annex A | 3 |  |  | If these are normative values for TIME\_SYSTEMS, why is there an option to document different settings in an ICD? I recalled conversations regarding normative values during the review process of the CDM at one of the CCSDS biannual meetings. | Juan Carlos Raymond/NASA GSFC | If the values in table 7 are normative, why should be given an option to document different values in an ICD. |  |
| 164 | A-1 | AnnexA | 1 | 2 | ed | Refers reader to reference F2, but Annex F is the XML example. | David Berry / NASA/JPL | Either change "F2" to "G2" OR potentially combine the KVN example and XML example into the same Annex. Also be aware of next comment. You may need to change "F2" to "H2". |  |
| 165 | A-1, B-2, C-1, D-4 | Appendices A, B, C and D | Titles |  |  | The tittles and the page numbers seemed to be formatted incorrectly. | Juan Carlos Raymond/NASA GSFC | Suggest updating the format of the titles and fix the numbering of the pages. |  |
| 166 | Annex H | N/A | N/A | N/A | te | Missing Requirement: There should be a requirement to clearly identify the object to which the data applies. A similar requirement is in all Nav WG standards. | David Berry / NASA/JPL | Add such a requirement. |  |
| 167 | Annex H | N/A | N/A | N/A | te | Missing Requirement: There should be a requirement to clearly identify the instrument to which the data applies.  | David Berry / NASA/JPL | Add such a requirement. |  |
| 168 | Annex H | N/A | N/A | N/A | te | Missing Requirement: There should be a requirement stating that an XML representation must be provided. A similar requirement is in most/all Nav WG standards. | David Berry / NASA/JPL | Add such a requirement (rationale is that CCSDS CMC required such a representation for Navigation WG standards). |  |
| 169 | Annex H | N/A | N/A | N/A | te | Missing Requirement: There should be a requirement statement that motivated you to design the dynamic mnemonic keyword mechanism.  | David Berry / NASA/JPL | Add such a requirement. |  |
| 170 | Annex H | N/A | N/A | N/A | te | Missing Requirement: There should be a requirement to provide a reference frame for applicable data. A similar requirement is in all Nav WG standards. | David Berry / NASA/JPL | Add such a requirement. |  |
| 171 | Annex H | N/A | N/A | N/A | te | Missing Requirement: There should be a requirement stating the need to provide calibration information for the instruments.  | David Berry / NASA/JPL | Add such a requirement. |  |
| 172 | Annex H | N/A | N/A | N/A | te | Missing Requirement: It seems that there should be some type of requirement relating to units. A similar requirement is in all Nav WG standards. (NOTE: I think units could be a big problem for implementers of the NHM, so we should think about this carefully). | David Berry / NASA/JPL | Add such a requirement. |  |
| 173 | Annex H | N/A | N/A | N/A | te | Missing Requirement: There should be a requirement stating the need to provide calibration information for the instruments.  | David Berry / NASA/JPL | Add such a requirement. |  |
| 174 | B-3 | Annex B | B2.2 |  |  | There is a note in B2.2. I could not figure out what the note was for. Joseph Hashmall’s note to re-register new sensors and data types should be explicitly mentioned in the section. | Juan Carlos Raymond/NASA GSFC | Suggest writing the note of re-registration of new sensors and data types as new hardware becomes available. |  |
| 175 | B-3 | B1.7 | 1 | 2 | ed | Expand acronym | David Berry / NASA/JPL | From: "IT"To: "Information Technology" |  |
| 176 | B-3 | B2 | Missing | Missing | ed, te | Add a paragraph that is required by the SANA operator. | David Berry / NASA/JPL | Between B2 and B2.1, add the following:"The following NHM-related items will be registered with the SANA Operator. The registration rule for new entries is the approval of new requests by the CCSDS Navigation Working Group Chair.  |  |
| 177 | B-3 | B2.1 | 1 | 1 | te | Add a line to the paragraph. | David Berry / NASA/JPL | After the existing sentence, add a second sentence: "New requests for this registry should be sent to SANA (mailto:info@sanaregistry.org)." |  |
| 178 | B-3 | B2.2 | 1 | 1 | te | Add a line to the paragraph. | David Berry / NASA/JPL | After the existing first sentence, add a second sentence: "New requests for this registry should be sent to SANA (mailto:info@sanaregistry.org)." |  |
| 179 | B-3 | B2.2 | 2 | 1 | ed | Incomplete Note | David Berry / NASA/JPL | From: "Note: See"To: ??? |  |
| 180 | C-1 | Annex C | Paragraph 1, line 3 |  |  | I could not figure out if the word Mnemonics was allowed within the NHM. It was removed in a couple places within the standard. | Juan Carlos Raymond/NASA GSFC | Is the Mnemonic word allowed to be used in this standard? Would it conflict with any other usage of the word mnemonic in other standards? Should the first paragraph read “The values in this annex represent examples of values associated with three fields of the DEFINE keyword in the records of the Metadata Section.  |  |
| 181 | C-1 | Annex C | Paragraph 2, line 1 |  |  | At a first glance, I did not know what you meant by the table and the specification of the columns within a table. I initially thought it was the values for the DEFINE keyword. It did not come to me clear how they make up the values within the keyword unless I read the entire proposed NHM standard. | Juan Carlos Raymond/NASA GSFC | Do you think making a reference to the table C-1 would help the reader understand what columns you are referring to and how you make a “mnemonic” as a value within the DEFINE keyword from that table? In other words, it would be nice to show the relationship of the table with the values in the DEFINE keyword. |  |
| 182 | C-1 | Annex C | Table C-1 |  |  | Is there a rule or restriction in the number of letters to make up the values? If it is limited to 3 values, then the value PWRR should be PWR. It is hard to know that there is a 3 letter limit in the values unless I read the entire standard. You could have used GNC because not all the hardware types are related to ACS. For instance, Accelerometers can be deemed to be essential for Orbit Determination and Control along with the NAV. | Juan Carlos Raymond/NASA GSFC | Are the values limited to 3 letters? Should PWRR be PWR for power? If there is no limit in the number of letters, shouldn’t we make new ones for ADCS (Attitude Determination and Control System) and GNC (Guidance, Navigation and Control? |  |
| 183 | C-1 | N/A | Units | N/A | ed, te | There is no mention of an ICD here, however, because there are potentially many different units possible for measurements from some of the hardware types, it seems there should be some statement to the effect that "An ICD must identify which units are used for which instruments and/or measurements." | David Berry / NASA/JPL | Consider adding a statement about the necessity for elaboration of units in the ICD. |  |
| 184 | C-1 | Table C-1 | NAV | N/A | te | Is the only data from the NAV system the ephemeris? Should we remove the "(ephemeris)" qualifier? | David Berry / NASA/JPL | Consider . |  |
| 185 | C-1 through C-3 | Annex C | Table C-1 |  |  | I reviewed the list of hardware, measurement and unit types, and came up with many more. For example, the AST also provides a quality factor or index, or the accuracy of the attitude that is valuable for analysts. Modern ASTs also provide rates and could have an internal IRU for full AD. | Juan Carlos Raymond/NASA GSFC | It would be nice to say why the values, measurement and unit types are limited to those in the table. |  |
| 186 | C-1 through D-4 | Annex C and D | Tables |  |  | I could not understand the relationship of the measurement and unit types in table of the SANA registry and the info that make up the rest of the “mnemonic” within the DEFINE keyword? | Juan Carlos Raymond/NASA GSFC | Shouldn’t the measurement and unit types in table of the SANA registry match the info that make up the rest of the “mnemonic”? |  |
| 187 | C-2 | Annex C-1 | Table C-1 NAV value |  |  | I did not understand why ephemeris is inside parenthesis here in the meaning. There is more into NAV than just ephemeris and how do you make the distinction between just orbit ephemeris and other relevant info for orbit determination?  | Juan Carlos Raymond/NASA GSFC | Why is ephemeris inside parenthesis here in the meaning? There is more into NAV than just ephemeris. How do you make the distinction between just orbit ephemeris and other relevant info for orbit determination? |  |
| 188 | C-2 | Table C-1 | ACC | N/A | te | Lacks a unit identifier | David Berry / NASA/JPL | Add units for acceleration. |  |
| 189 | C-2 | Table C-1 | N/A | N/A | ed | The table headings do not appear on pages 2 and 3. | David Berry / NASA/JPL | Use MS Word "Heading Rows Repeat" feature. |  |
| 190 | C-2 | Table C-1 | N/A | N/A | ed, te | Table is quite long for an example. It will take a lot of work to proofread as we approach the final standard. | David Berry / NASA/JPL | Consider shortening the examples. |  |
| 191 | C-2 | Table C-1 | N/A | 1 | ed | Value for Power System has 4 characters. (Note: This little typo pointed out to me that we don't specify anywhere that the system field should have 3 characters. | David Berry / NASA/JPL | From: PWRRTo: PWR |  |
| 192 | C-2 | Table C-1 | N/A | Units | ed, te | There are a few inconsistencies in the Units column of the table, "degrees" and "deg", "radians" and "rad", "sec" and "s", "mA" and "milliamps" | David Berry / NASA/JPL | Pick one designation and stick with it |  |
| 193 | C-2 | Table C-1 | PSI | N/A | te | I think "PSI" might be too generic for a Hardware Type, but I think it could be a good "System Field" value. | David Berry / NASA/JPL | Consider moving "PSI" to the "System Field" section of the table. |  |
| 194 | C-2 | Table C-1 | THR | Units | te | Seems that there would be units for tank pressure other than "counts". Also, might there also be accumulated on time? | David Berry / NASA/JPL | Consider augmenting units field accordingly. |  |
| 195 | D-4 | Annex D | Table D-1 |  |  | It was not clear why the example refers to info that should be included in an ICD. The mnemonic in the DEFINE keyword came from normative values. | Juan Carlos Raymond/NASA GSFC | I think a brief introduction of why this info should be included in an ICD could be helpful to understand the table. The mnemonic within the DEFINE keyword came from normative values. It would be nice to give a full description of the mnemonic given in the table like EYE current and what I4B means. Without reading the whole standard, it is hard to understand the meaning of the annex. |  |
| 196 | D-4 | Annex D | Title |  |  | The example should be the value of the DEFINE keyword if the word mnemonic should not be used within the NHM.  | Juan Carlos Raymond/NASA GSFC | Should the tittle be changed to say that it is value of the DEFINE keyword in the form of a mnemonic or something of this nature? |  |
| 197 | D-4 | Table D-1 | N/A | N/A | te | The information included in an ICD should specify which of the many potential units applies to a given measurement. | David Berry / NASA/JPL | Consider adding a specification of the units that applies to a given mnemonic. |  |
| 198 | E-1 | Example | N/A | 1 | te | The CCSDS\_NHM\_VERS lacks an "=" sign | David Berry / NASA/JPL | Add the "=" between keyword and value. |  |
| 199 | E-1 | Example | N/A | 4 | te | The text value is lacking quotes | David Berry / NASA/JPL | From: NASATo: 'NASA' (as required by the current draft, though I happen to really think the quotes requirement should be removed). The way the standard is written, then the values in this example for the COMMENT, ORIGINATOR, TIME\_SYSTEM, DEFINE, and FRAME keywords should be in quotes. |  |
| 200 | E-1 | Example | N/A | After 6 | te | The OBJECT\_NAME and OBJECT\_ID are not specified. | David Berry / NASA/JPL | Add the missing required keywords. NOTE: This also affects the XML example in Annex F. I need to send you a new example! |  |
| 201 | E-1 | Example | N/A | 7 | te | The START\_TIME has an invalid date/time in it. | David Berry / NASA/JPL | Change 1709 to a year that is within the space age. The "hour" in the time is "4." which does not conform to the hour format (should be "04", with no period/decimal point). |  |
| 202 | E-1 | Example | N/A | 11 | ed | Minor typo | David Berry / NASA/JPL | From: milligausTo: milligauss |  |
| 203 | E-1 | Example | N/A | 17 | ed | Minor typo | David Berry / NASA/JPL | From: "First Star" To: "Second Star" (First star was defined on STAR1) |  |
| 204 | E-1 | Example | N/A | 25 | te | There is a second "START\_TIME" keyword that is out of place. It also contains an invalid value. It maybe was intended to be "STOP\_TIME", but it is still out of place and still has a wrong value. | David Berry / NASA/JPL | Delete second START\_TIME keyword or convert to STOP\_TIME and move to proper place in message. |  |
| 205 | E-1E-2 | Example | N/A | 28ff | te | The timetags in the example are invalid... the years are only 3 characters, and they do not correspond with the START\_TIME in the metadata. The month is invalid (13). | David Berry / NASA/JPL | I know the data are not "real" but they should be "realistic". |  |
| 206 | E-1E-2 | Example | N/A | 33-342-3 | te | The mnemonic ACS.STA2.\* is not defined. | David Berry / NASA/JPL | Either define the mnemonic or change STA2 to STA1. Probably the latter is easier. |  |
| 207 | F-1 | Example | 1 | 1 | ed | Use of indefinite article | David Berry / NASA/JPL | From: "... a NHM..."To: "...an NHM..." |  |
| 208 | F-3 F-4 | XML Metadata |  |  | ed, te | I have to say I prefer the older "<MNEMONIC>" metadata keyword (now replaced by "<DEFINE>"). This is related to my comments above regarding page 4-6. The XML "<defineSet>" makes it clear to me that "<MNEMONIC>" is the appropriate tag for defining the mnemonic keyword... this is not so apparent in the KVN metadata section. Using "<MNEMONIC>" in the metadata also provides a clear link to the data in the Data Section. | David Berry / NASA/JPL | Suggest for discussion at London meetings. |  |
| 209 | F-3 ff | All | All | All | ed | The example is OK, but perhaps doesn't need to be so long. The example was one developed to test the NHM schema, so it includes all possible combinations of FRAME and CALCURVE. This is fine, and easy to check because it's automated, but not all of it is necessary to get the point across. (NOTE: Since I did this example myself, I apologize for inflicting this comment upon you!) | David Berry / NASA/JPL | Consider a shorter XML example.  |  |
| 210 | G-1 |  |  |  | ed | References labeled F1-F3 should be G1-G3 (or maybe H1-H3 given requirement to add ICS annex) | David Berry / NASA/JPL | Change references here and throughout document. |  |
| 211 | H-1 | N/A | 3 | 1 | ed, te | Overly categorical statement. | David Berry / NASA/JPL | Add "may" to the statement to allow options.From: "It is expected that the data in various messages not be exclusive."To: "It is expected that the data in various messages may not be exclusive." |  |
| 212 | H-1 | N/A | 3 | 2 | ed, te | Overly categorical statement. | David Berry / NASA/JPL | Change "will" to "could".From: "... both the Attitude NHM and the Health and Safety Monitoring NHM will contain..."To: "... both the Attitude NHM and the Health and Safety Monitoring NHM could contain..." |  |
| 213 | H-1 | N/A | 5 | 2 | te | Unreasonable expectation? | David Berry / NASA/JPL | The asserted expectation that "identical (or at least similar) forms will be used for corresponding data from different missions" may not be a reasonable expectation. We should discuss this at London. |  |
| 214 | H-2 | NHM-P05 | N/A | N/A | te | Lacks a trace to XML in section 4 | David Berry / NASA/JPL | Add trace to ASCII requirement in Section 4. |  |
| 215 | H-3 | NHM-D04 | N/A | N/A | te | The "Requirement" uses "shall", which is consistent with section 3.1.5. However, it is labelled as a "Desirable Characteristic" when it should be a "Primary Requirement". | David Berry / NASA/JPL | Move the "NHM-D04" row into the table of Primary Requirements and re-number the Primary Requirements accordingly. |  |
| 216 | I-1 | Graphic |  |  | ed | Graphic seems to be broken. | David Berry / NASA/JPL | Upload new graphic. |  |
| 217 | J-1 | J1 | 1 | 3-4 | te | Dumb question based on my ignorance... somehow it seems odd to me that a body frame would be defined relative to one or more specific instrument frames... it makes more sense to me the other way around, but I'm no expert. | David Berry / NASA/JPL | None |  |
| 218 | J-1 | J1 | 3 | All | ed, te | The frame definitions expressed in this Annex should be specified in the ICD. | David Berry / NASA/JPL | Consider adding statement to the effect that frame definitions (if not standard, well documented frames) must be described in the ICD. |  |
| 219 | J-1 | N/A | 1 | 1 | ed | Minor typo | David Berry / NASA/JPL | From: FRAMESTo: FRAME |  |
| 220 | J-2 | J3 | 1 | last | ed | Minor verb tense | David Berry / NASA/JPL | From: "Definitions that might be used is given..."To: "Definitions that might be used are given..." |  |
| 221 | N/A | 4.x | N/A | N/A | te | Somewhere in Chapter 4 there should be a statement that the XML tags/values shall be composed of ASCII characters. | David Berry / NASA/JPL | Add suggested statement in appropriate place in Chapter 4. . Add to trace on requirement NHM-P05 |  |
| 222 | N/A | Missing (After AnnexA) | N/A | N/A | ed, te | The CCSDS now requires a normative "ICS" annex (Implementation Conformance Statement). See the CDM. | David Berry / NASA/JPL | For now, add a new Annex B for the ICS (it has to be normative, and all the normative annexes are required to appear before any informative annexes appear); bump the Annex designation for all other annexes starting with the existing Annex B up by one. |  |
| 223 | N/A | N/A | N/A | N/A | N/A | Note: Comments on Section 4 and 6, and Annexes F and H, were previously submitted. | David Berry / NASA/JPL | N/A |  |