| **Pg** | **Sec** | **Para** | **Line** | **Type** | **Comment/ Rationale** | **Reviewer (Name/Agency)** | **Suggested Disposition** | **Final Disposition**  **(Do Not Fill In)** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Cover | N/A | N/A | N/A | ge | The cover states it is "Version 3.5" from September 2012, but it's really Version 3.6 from March 2014. Page footers have the same incorrect information. | David Berry / NASA/JPL | Be sure to update the cover and page footers each version so people are certain which version they have. |  |
| ii | Foreword | 1 | 1 | ed | Rewrite first sentence of Foreword | David Berry / NASA/JPL | From: existing text  To: This CCSDS Report, *Navigation Data - Definitions and Conventions*, contains background and explanatory material... generated by CCSDS Member Agencies. It has been divided into two separate volumes. |  |
| 1-1 | 1.2 | 1 | 1-5 | ed, te | I think it's too early to introduce the notion of "flight-to-ground", etc. The reader has no context for understanding what is meant at this point in the document. | David Berry / NASA/JPL | Remove first paragraph in its entirety. Leave only the second paragraph ("This document serves as a guideline..."). It's sufficient. |  |
| 1-2 | 1.5 | Ref [1] | all | ed, te | The document cited as reference [1] has been replaced by a new document. | David Berry / NASA/JPL | Change existing text of reference [1] to "*Organization and Processes for the Consultative Committee for Space Data Systems".* CCSDS A02.1-4. Yellow Book. Issue 4. Washington, D.C.: CCSDS, April 2014. |  |
| 1-3 | 1.5 | Ref [14] | all | ed, te | The reference cites the Red Book... it should cite the Blue Book | David Berry / NASA/JPL | Update the reference to refer to the Blue Book. "Recommendation for Space Data System Standards, CCSDS 508.0-B-1. Blue Book. Issue 1. Washington, D.C.: CCSDS, June 2013. |  |
| 1-3 | 1.5 | Ref [15] | all | ed, te | The reference should be removed at this point since it won't be worked on for at least a couple of years, if that. | David Berry / NASA/JPL | Remove reference from reference list. |  |
| 1-3, 1-4 | 1.5 | Ref [16], [17], [18] | category for white books | ed, te | Category of documents is wrong in the reference citation. | David Berry / NASA/JPL | From: "Proposed for Space Data System Standards"  To: "Proposed Draft Recommended Standard". |  |
| 1-4 | 1.5 | Ref [19] | all | ed | We should put the Green Books together as contiguous references, i.e., instead of [13] and [19], either [13]/[14], or [14]/[15], or [18]/[19], or some other contiguous set. | David Berry / NASA/JPL | Consider. |  |
| 1-4 | 1.5 | N/A | N/A | ed | We should add a reference to the CCSDS web site | David Berry / NASA/JPL | Add [20] www.ccsds.org/publications (but note that since we should delete [15], you could make the website [15] with no perturbation. |  |
| 2-1 | 2.2.2 | 2 (Orbit) | 4 | ed, te | Uses the word "orbiting" in the definition of "orbit". Generally it is best not to use the word being defined in the definition. | David Berry / NASA/JPL | From: "...orbiting the large central body"  To: "...around the large central body" |  |
| 2-1 | 2.2.2 | 2 (Orbit) | 7 | ed, te | Word choice. | David Berry / NASA/JPL | From: "gravity pull"  To: "gravitational influences" |  |
| 2-1 | 2.2.2 | 3 (Attitude) | 7 | ed | Plural used where singular should be used. | David Berry / NASA/JPL | From: "...references axes..."  To: "...reference axes..." |  |
| 2-1 or 2-2 | 2.2.2 | N/A | N/A | te | Missing definitions. | David Berry / NASA/JPL | Because in section 1.1 it states that navigation includes "...orbit, attitude, maneuver, and conjunction assessment...", it might be a good idea to add BRIEF definitions of "maneuver" and "conjunction" here. |  |
| 2-2 | 2.2.2 | 1 | 3 | ed | word order | David Berry / NASA/JPL | From: "... the flight dynamics term could be used..."  To: "...the term 'flight dynamics' could be used..." |  |
| 2-2 | 2.2.2 | 2 | 1 | ed | capitalizes "Navigation" when it is probably not necessary. | David Berry / NASA/JPL | From: "within Navigation"  To: "within navigation" |  |
| 2-2 | 2.3 | 1 | 5 | ed | Unnecessary text should be removed. | David Berry / NASA/JPL | From: "Depending on the different ways an organization provides Flight Dynamics support, it can include..."  To: "Flight Dynamics support can include..." |  |
| 2-2 | 2.3 | 2, 3 | 1 | ed | Most of the material in these 2 paragraphs is unnecessary and should be deleted. Portions could be combined with the text in the preceding paragraph to make it more condensed, streamlined, and genericized. | David Berry / NASA/JPL | Add to the list of flight dynamics support in paragraph one, the "precise determination of a spacecraft's orbit and attitude, maneuver planning, sensor calibration, and development of acquisition predicts for tracking stations." The last sentence in paragraph 2 is OK too, the one about uploading to the spacecraft. |  |
| 2-3 | 2.3.1 | 1 | 3 | ed | Unnecessary qualification. | David Berry / NASA/JPL | From: "...in drag models..."  To: "...in models..." |  |
| 2-3 | 2.3.1 | 4 | All | ed | Paragraph is unnecessary | David Berry / NASA/JPL | Remove paragraph 4. The last sentence ("This model can be made more accurate..." might conceivably be combined at the end of paragraph 3). |  |
| 2-4 | 2.3.1 | last | 1,2 | ed | "Conjunction Assessment" is capitalized, but need not be ("orbit" and "attitude" which precede it are not capitalized) | David Berry / NASA/JPL | From: "... Conjunction Assessment (CA)..."  To: "... conjunction assessment (CA)..." |  |
| 2-6 | 2.3.1 | Fig 2-3 | N/A | te | The diagram doesn't have any predicted observations or measurements entering the "Compare" process. | David Berry / NASA/JPL | Revise diagram |  |
| 2-6 | 2.3.1 | Fig 2-4 | N/A | ed, te | The figure refers to "OEMs" and "CDMs", but these haven't been defined yet. It also uses the term "Maneuver Ephemeris" as if it were different from a "Satellite Ephemeris". If you have the original figure I think it should be modified. | David Berry / NASA/JPL | If possible, change from "Satellite Ephemeris" to "Satellite State", from "Maneuver Ephemeris" to "Maneuver Plan", from "OEMs" to "Satellite Ephemeris ", from "CDMs" to "conjunction warnings" |  |
| 2-6 | 2.3.1 | Fig 2-4 | N/A | ed, te | The figure shows that "Plan Collision Avoidance Maneuver" is the only result of "Risk Assessment". | David Berry / NASA/JPL | The figure should have "Risk Assessment" shown as a decision box with "No Maneuver Needed" (or something like that) as one of the outputs. |  |
| 2-7 | 2.3.2 | 1 | Most | ed, te | Most of this paragraph is not necessary. | David Berry / NASA/JPL | I would change the first sentence to "The principal physical assets of concern for flight dynamics are the spacecraft, tracking stations, and agency centers." I would delete the rest of the paragraph as unnecessary to the purpose of this document. The reduced scope is also consistent with material later in the document. |  |
| 2-7 | 2.3.2 | Fig 2-5 | Figure | ed | The figure is way too NASA-centric, and really may not be necessary. | David Berry / NASA/JPL | Delete figure. |  |
| 2-7 | 2.3.2.1 | 1 | 4 | ed, te | The material starting with "The spacecraft design..." is not necessary to the purpose of this document. | David Berry / NASA/JPL | Starting with "The spacecraft design..." and extending through the end of the paragraph, remove the text. |  |
| 2-8 | 2.3.2.1 | 1 | 1 | ed | Combine this sentence with the shortened previous paragraph. | David Berry / NASA/JPL | Consider. |  |
| 2-8 | 2.3.2.1 | 2 | 1 | ed, te | Word choice for consistency with the heading of section 2.3.2.1 | David Berry / NASA/JPL | From: "The flight trajectory..."  To: "The spacecraft trajectory..." |  |
| 2-8 | 2.3.2.1 | 2 | 1 | te | Mention TDM during discussion of trajectory determination. | David Berry / NASA/JPL | From: "...using tracking measurements. It can..."  To: "...using tracking measurements, which can be represented in the CCSDS Tracking Data Message (TDM, reference [8]). The trajectory so determined can..." |  |
| 2-8 | 2.3.2.1 | 3 | 1 | ed | Word choice for consistency with the heading of section 2.3.2.1 | David Berry / NASA/JPL | From: "The attitude, which covers both spacecraft orientation and body rates..."  To: "The spacecraft attitude, which covers both orientation and body rates..." |  |
| 2-8 | 2.3.2.1 | 3 | 8-9 | te | statement needs qualification | David Berry / NASA/JPL | From: "...navigate autonomously once in orbit..."  To: "...navigate autonomously once in Earth orbit..." |  |
| 2-8 | 2.3.2.1 | 3 | 10-11 | ed, te | Try not to describe what organization performs functions | David Berry / NASA/JPL | From: "... attitude determination process is performed on the ground by flight dynamics to improve..."  To: "... attitude determination process is performed on the ground to improve..." |  |
| 2-8 | 2.3.2.1 | 3 | 11-12 | ed, te | Try not to describe what organization performs functions | David Berry / NASA/JPL | From: "Flight dynamics also responsible performs ground calibration of the sensors to improve..."  To: "Calibration of the sensors is also performed on the ground to improve..." |  |
| 2-8 | 2.3.2.1 | 3 | 13-15 | ed, te | Text unnecessary to the purpose of this document (too detailed and too specific) | David Berry / NASA/JPL | Starting with "On rare occasions..." delete to the end of the paragraph. |  |
| 2-9 | 2.3.2.1 | 1 | 1 | ed, te | First sentence is unnecessary. | David Berry / NASA/JPL | Delete first sentence. Start the paragraph with "Attitude maneuvers are designed..." |  |
| 2-9 | 2.3.2.1 | 1 | 2,3 | ed | Awkward sentence | David Berry / NASA/JPL | From: existing text  To: "Attitude maneuvers are designed for many purposes, for example, to point payload instruments at desired targets, calibrate attitude sensors, calibrate science instruments, support orbit maneuver goals, and maintain the sun angle." |  |
| 2-9 | 2.3.2.1 | 2 | N/A | ed, te | Might consider mentioning PRM too. | David Berry / NASA/JPL | The second paragraph mentions SMM, as it should. Perhaps also add that "Attitude maneuvers may also be designed to accommodate pointing requests submitted via the CCSDS Pointing Request Message (PRM, section 3.3.2.5 or reference [16])." |  |
| 2-9 | 2.3.2.2 | title | N/A | ed, te | Shorten the title to be consistent with the assertion of principal assets. | David Berry / NASA/JPL | From: "Ground Stations and Space Networks"  To: "Tracking Stations" |  |
| 2-9 | 2.3.2.2 | 1 | 1 | ed, te | Shorten first sentence | David Berry / NASA/JPL | From: "Ground stations and space networks..."  To: "Tracking stations..." |  |
| 2-9 | 2.3.2.2 | 1 | 1-3 | ed | Unnecessary sentence | David Berry / NASA/JPL | Remove "Both space and ground stations... between the spacecraft and the ground." |  |
| 2-9 | 2.3.2.2 | 1 | 3-4 | ed, te | Add space network assets | David Berry / NASA/JPL | From: "... a network of fixed ground stations located around the world."  To: "... networks of fixed ground stations located around the world and strategically placed geosynchronous relay satellites." |  |
| 2-9 | 2.3.2.2 | 1 | 5 | ed, te | Change "ground" to "tracking" | David Berry / NASA/JPL | From: "Whenever an orbiting spacecraft passes across the field of coverage of a ground station..."  To: "Whenever an orbiting spacecraft passes across the field of coverage of a tracking station..." |  |
| 2-9 | 2.3.2.2 | 1 | last 2 | ed | The last 2 lines ("Spacecraft are sometimes equipped...") are not necessary to the purpose of this document. | David Berry / NASA/JPL | Remove. |  |
| 2-9 | 2.3.2.2 | 1 | N/A | te | Mention TDM. | David Berry / NASA/JPL | Add a sentence at the end something like "The measurements collected via tracking networks can be represented in the CCSDS Tracking Data Message (TDM, reference [8])." Could substitute "TDM" for "Tracking Data Message" since the acronym was previously defined. |  |
| 2-9  2-10 | 2.3.2.3 ff | All | All | ed | The material in these sections (2.3.2.3, 2.3.2.3.1, 2.3.2.3.2) is much, much more detailed than is necessary given the purpose of this document. Consider that the first version of the Green Book only had the material that is now in Section 3.2 of this version of the document. It was very brief, and probably sufficient to the task. | David Berry / NASA/JPL | The entire section 2.3.2.3 should be written much more succinctly. I think 2.3.2.3.1 can be entirely deleted and so can most of 2.3.2.3.2. It really is sufficient to state that the recipients and users of navigation data messages perform flight dynamics functions in agency centers that may be called "Mission Operations Centers" or "Flight Dynamics Centers". We don't need exhaustive list of functions or duties (they were already defined at the beginning of section 2.3. The last sentence of 2.3.2.3.2 may be salvageable (see next comment). |  |
| 2-10 | 2.3.2.3.2 | 2 | 1 | ed, te | Refer to the main purpose of the navigation working group. | David Berry / NASA/JPL | From: "...of the CCSDS, navigation data and a common format..."  To: "... of the CCSDS, standards for the representation navigation data and a common format..." |  |
| 3-1 | 3.1 | 1 | 2-4 | ed | I think the "Navigation Message Exchange Framework" should stand alone in Section 3, and that a Section 4 should be added for the "... current and envisioned Navigation Data Messages" | David Berry / NASA/JPL | In Section 3.1, leave just the first existing sentence. Create a new |  |
| 3-1 | 3.2 | Navigation Data | 3 | ed, te | Add clarifying text. | David Berry / NASA/JPL | From: "... and ancillary information."  To: "... and ancillary information related to navigation." |  |
| 3-1 | 3.2 | Navigation Message | 1 | ed, te | Over time, we have been referring to "Navigation Data Messages" (and there are a number of instances of this phrase in the book)... but there is also the term "Navigation Message" in this book (and earlier versions of the green book). | David Berry / NASA/JPL | Consider whether or not we should change "Navigation Message" (21 instances) to "Navigation Data Message" (10 instances), or vice versa. Should we be consistent? Either choice ... both phrases occur many times in the document. For discussion at London? or on a telecon? |  |
| 3-2 | 3.2 | Agency Center | 2 | ed | The acronyms "MOC" appears (here and elsewhere) but it is not listed in the acronym list. | David Berry / NASA/JPL | Add "MOC" to the acronym list. |  |
| 3-3 | 3.3.1.1 | 1 | 1 | ed | During transition phase, list both references to Green Book. | David Berry / NASA/JPL | From: [45]  To: [13], [19] |  |
| 3-3 | 3.3.1.1 | 1 | 2-4 | ed | Obsolete text... the table to which it refers was removed. | David Berry / NASA/JPL | Remove text from "For current and future..." until the end of the paragraph. |  |
| 3-3 | 3.3.1, 3.3.1.1, 3.3.1.2 | 1  1  1 | All | ed | I recommend combining these three sections into a common section numbered 3.3.1. The paragraphs are short, and are not distinct enough to require 3 separate numbered paragraphs. | David Berry / NASA/JPL | Combine 3.3.1, 3.3.1.1, 3.3.1.2 into a new 3.3.1 |  |
| 3-5 | 3.3.2 | 1 | All and ff | ed, te | I recommend that the remainder of the document (up until Annex A) become a separate section 4 entitled "CCSDS Navigation Data Messages". This section 4 should be divided into sections as follows:  4.1 General  4.2 Completed Navigation Data Messages  4.3 Planned Navigation Data Messages | David Berry / NASA/JPL | Consider... I think it divides the "theoretical" of Section 3 from the practical considerations of actual messages. |  |
| 3-5 | 3.3.2 | all | all | ed | Renumber 4.1 and title it "General" | David Berry / NASA/JPL | Consider |  |
| 3-5 | 3.3.2 | N/A | N/A | te | We shoud indicate that this section reflects an application of the Navigation Message Exchange Framework described in Section 3. | David Berry / NASA/JPL | Somewhere in the text, probably early, indicate that this section reflects an application of the Navigation Message Exchange Framework described in Section 3. |  |
| 3-5 | 3.3.2 | 1 | 7 | ed | The phrase "flight dynamics or navigation functions" is potentially awkward given the many opportunities to use it in such a document. | David Berry / NASA/JPL | Pick one... "flight dynamics" or "navigation". In this book we have (for better or for worse) more or less made the terms identical in meaning. |  |
| 3-5 | 3.3.2 | 1 | 10 | ed | Word choice | David Berry / NASA/JPL | From: "...potentially enable..."  To: "...facilitate..." |  |
| 3-5 | 3.3.2 | 2 | 1 | ed, te | The section doesn't reflect publication of the CDM. Written number and symbolic number redundancy is not necessary. | David Berry / NASA/JPL | From: "... currently three (3) published standards..."  To: "... currently four published standards..." |  |
| 3-5 | 3.3.2 | 2 | 2 | ed | Typo "The" (doesn't need to be capitalized). | David Berry / NASA/JPL | From: "...The...  To: "... the..." |  |
| 3-5 | 3.3.2 | 2 | 4 | ed, te | CDM is not in the list of published standards. | David Berry / NASA/JPL | From: "ADM, ODM and TDM"  To: "ADM, ODM, TDM, and CDM" |  |
| 3-5 | 3.3.2 | 2 | 4 | ed, te | CDM is not in the list of references | David Berry / NASA/JPL | From: "[6], [7] and [8], respectively"  To: "[6], [7], [8], and [14], respectively" |  |
| 3-5 | 3.3.2 | 2 | 6-7 | ed, te | Redundant text | David Berry / NASA/JPL | From: "... other flight dynamics functions within the navigation process."  To: "... other flight dynamics functions."  OR: "... other navigation functions." |  |
| 3-5 | 3.3.2 | 2 | 7-8 | ed, te | CDM is in the list of standards under development. | David Berry / NASA/JPL | Remove CDM from the list of standards under development. |  |
| 3-5 | 3.3.2 | 2 | 9 | ed | Add conjunction before last element in list | David Berry / NASA/JPL | From: "..., Spacecraft Maneuver Message..."  To: "..., and Spacecraft Maneuver Message..." |  |
| 3-5 | 3.3.2 | 2 | 10-11 | ed, te | Rewrite last sentence... not complete, has no reference. | David Berry / NASA/JPL | From: existing text  To: "The three actions to be considered in the five year review are 'reconfirm', 'retire', or 'revise', as applicable (see reference [1])." |  |
| 3-6 | 3.3.2 | 1 | 2-3 | ed | Simplify sentence and make it clearer. | David Berry / NASA/JPL | From: "... to enable the generation and ingest of input and output products of navigation processes in an automated manner."  To: "... to enable automation of navigation processes." |  |
| 3-6 | 3.3.2 | 1 | 6 | ed | Simplify sentence and make it clearer. | David Berry / NASA/JPL | From: "... specified in ICDs or by following a CCSDS standard on transmission."  To: "... specified in ICDs." |  |
| 3-6 | 3.3.2 | 1 | 7 | ed | Typo | David Berry / NASA/JPL | From: "...filed based..."  To: "... file based..." |  |
| 3-6 | 3.3.2 | 1 | 10 | ed | Add reference at end of sentence. | David Berry / NASA/JPL | From: "... available free of charge at the CCSDS website."  To: "...available free of charge at the CCSDS website (reference [20])." |  |
| 3-6 | 3.3.2 | 2 | 1 | ed | Clarifying text | David Berry / NASA/JPL | From: "Figure 3-5 illustrates how all the messages are intended to be utilized..."  To: "Figure 3-5 illustrates an example of how all the messages could be utilized..." |  |
| 3-6 | 3.3.2 | N/A | N/A | ed, te | I think an additional short paragraph could help. | David Berry / NASA/JPL | Add a short paragraph: "The remainder of this document provides an overview of the CCSDS flight dynamics standards that have been published (see 4.2) and are under development (see 4.3)." |  |
| 3-7 | Figure 3-5 | N/A | N/A | ed | Suggestions for caption... I would add the word "Example" and remove the note about Flight-to-flight. | David Berry / NASA/JPL | From: existing  To: "Figure 3-5: Example NDM Exchange and Information Flow in a Mission Operations Environment" |  |
| 3-7 | After Figure 3-5 | N/A | N/A | ed | Add a section 4.2 with title "Flight Dynamics Standards Published" | David Berry / NASA/JPL | Consider. |  |
| 3-7 | 3.3.2.1 | Title | 1 | ed | Renumber TDM section | David Berry / NASA/JPL | From: 3.3.2.1  To: 4.2.1 |  |
| 3-7 | 3.3.2.1 | 1 | 4 | ed | Minor typo | David Berry / NASA/JPL | From: "mission"  To: "missions" |  |
| 3-8 | 3.3.2.1 | 3 | 4 | ed | word choice | David Berry / NASA/JPL | From: "... various agencies, a TDM could be supplemented..."  To: "... various agencies, a TDM should be supplemented..." |  |
| 3-8 | 3.3.2.2 | Title | 1 | ed | Renumber ODM section | David Berry / NASA/JPL | From: 3.3.2.2  To: 4.2.2 |  |
| 3-8 | 3.3.2.2 | Title | 1 | ed, te | Typo in title ("message" is plural for the ODM because there are 3 of them: OPM, OEM, OMM). | David Berry / NASA/JPL | From: "Orbit Data Message (ODM)"  To: "Orbit Data Messages (ODM)" |  |
| 3-8 | 3.3.2.2 | 1 | 3 | ed | Re-order sentences. | David Berry / NASA/JPL | Move 3rd sentence ("The ODM standard specifies...") to be the first sentence. Add the "(reference [7])" after "standard". |  |
| 3-8 | 3.3.2.2 | 1 | 1 | ed | Remove reference and augment sentence. Correct typo "The Orbit Parameter Message"... "The" need not be capitalized. | David Berry / NASA/JPL | From: "The ODM (reference [7]) is divided into three separate messages: The Orbit Parameter Message, ..."  To: "The ODM is divided into three separate messages that serve different purposes: the Orbit Parameter Message, ..." |  |
| 3-8 | 3.3.2.2 | 1 | 4 | ed | Remove unnecessary article | David Berry / NASA/JPL | From: "...transferring the orbit information..."  To: "...transferring orbit information..." |  |
| 3-9 | 3.3.2.2 | 1 | All | ed | Move paragraph to improve the flow of this section | David Berry / NASA/JPL | Move the entire paragraph that starts "Multiple OPM, OMM, or OEM..." to be just before paragraph 6 on the page, the paragraph that starts "The ODM has been assimilated..." |  |
| 3-9 | 3.3.2.2 | 2 | 4 | te | word choice and grammar | David Berry / NASA/JPL | From: "Neither the OPM or OMM require higher fidelity dynamic modeling."  To: "Neither the OPM nor OMM is designed to provide higher fidelity dynamic modeling." |  |
| 3-9 | 3.3.2.2 | 2 | 6 | ed, te | word choice | David Berry / NASA/JPL | From: "...instantaneous maneuvers and allows modeling of..."  To: "...instantaneous maneuvers and provides simple parameters for modeling of..." |  |
| 3-9 | 3.3.2.2 | 3 | 6 | ed | word choice and grammar | David Berry / NASA/JPL | From: "The OEM is the only ODM that required higher level of fidelity..."  To: "The OEM is the only ODM that accommodates higher level fidelity..." |  |
| 3-9 | 3.3.2.2 | 4 | 3 | ed | missing closing parenthesis | David Berry / NASA/JPL | From: "...(see reference [10].  To: "...(see reference [10]). |  |
| 3-9 | 3.3.2.2 | 6 | 1-2 | ed | Add a sentence... | David Berry / NASA/JPL | From: "... the CCSDS Member Agencies. The OEM..."  To: "... the CCSDS Member Agencies. A partial list of implementations follows. The OEM..." |  |
| 3-10 | 3.3.2.2 | 1 | 3 | ed, te | Add a sentence at end of partial paragraph. | David Berry / NASA/JPL | Add: "OEMs are also used for owner/operator ephemerides in conjunction assesment by NASA/GSFC for the Collision Avoidance Risk Assessment (CARA) process and by the Joint Space Operations Center (JSpOC). |  |
| 3-10 | 3.3.2.3 | Title | 1 | ed | Renumber ADM section | David Berry / NASA/JPL | From: 3.3.2.3  To: 4.2.3 |  |
| 3-10 | 3.3.2.3 | Title | 1 | ed, te | Typo in title ("message" is plural for the ADM because there are 2 of them: APM, AEM). | David Berry / NASA/JPL | From: "Attitude Data Message (ADM)"  To: "Attitude Data Messages (ADM)" |  |
| 3-10 | 3.3.2.3 | 1 | 1 | ed | Word choice | David Berry / NASA/JPL | From: "The intent of the ADM..."  To: "The purpose of the ADM..." |  |
| 3-10 | 3.3.2.3 | 1 | 1-2 | ed, te | CCSDS standards are not supposed to "discuss", rather they specify. | David Berry / NASA/JPL | From: "... is to discuss how... for proper interpretation and delineate a format and keywords..."  To: "... is to delineate a format and keywords..." |  |
| 3-10 | 3.3.2.3 | 3 | 3-6 | ed | Sentence location. | David Berry / NASA/JPL | Move to page 3-11 after "respectively" the sentence in line 3 that starts with "Multiple APM or AEM..." and ends with "... multiple AP or AEM files must be used." |  |
| 3-10 | 3.3.2.3 | 3 | 9 | ed | Move the sentence that starts with "Full details..." | David Berry / NASA/JPL | Move the sentence "(Full details on the ADM can be found in reference [6].) so that it appears on page 3-11 just after the "Multiple APM or AEM..." paragraph. |  |
| 3-11 | 3.3.2.4 | Title | 1 | ed | Renumber CDM section | David Berry / NASA/JPL | From: 3.3.2.4  To: 4.2.4 |  |
| 3-11 | 3.3.2.4 | 1 | 1 | ed | Verb tense error | David Berry / NASA/JPL | From: "The CDM (reference [14]) will specify the format..."  To: "The CDM (reference [14]) specifies the format..." |  |
| 3-11 | 3.3.2.4 | 1 | 1 | ed | Verb tense error | David Berry / NASA/JPL | From: "The CDM (reference [14]) will specify the format..."  To: "The CDM (reference [14]) specifies the format..." |  |
| 3-11 | 3.3.2.4 | 1 | 4 | ed | word choice | David Berry / NASA/JPL | From: "... possible conjunctions between objects in space..."  To: "... possible conjunctions with another space object..." |  |
| 3-11 | 3.3.2.4 | 2 | 1 | ed | grammar/verb subject agreement | David Berry / NASA/JPL | From: "...the identity of the affected object, miss distance, ..."  From: "...the identity of the affected objects, miss distance, ..." |  |
| 3-11 | Between 3.3.2.4 and 3.3.2.5 | N/A | N/A | ed | Add a section 4.3 with title "Flight Dynamics Standards in Development" | David Berry / NASA/JPL | Consider. |  |
| 3-11 | 3.3.2.5 | Title | 1 | ed | Renumber PRM section | David Berry / NASA/JPL | From: 3.3.2.5  To: 4.3.1 |  |
| 3-11 | 3.3.2.5 | 2 | 5 | ed | word choice | David Berry / NASA/JPL | From: "...transmitted between scientists..."  To: "...transmitted from scientists..." |  |
| 3-12 | 3.3.2.5 | 1 | 3 | ed | grammar/verb-subject agreement (add an "s" on "follow") | David Berry / NASA/JPL | From: "... such pointing requests are as follow:"  To: "... such pointing requests are as follows:" |  |
| 3-12 | 3.3.2.6 | Title | 1 | ed | Renumber NHM section | David Berry / NASA/JPL | From: 3.3.2.6  To: 4.3.2 |  |
| 3-12 | 3.3.2.7 | Title | 1 | ed | Renumber SMM section | David Berry / NASA/JPL | From: 3.3.2.7  To: 4.3.3 |  |
| 3-13 | 3.3.2.8 | Title | 1 | ed | Renumber "Navigation Data Message Formats" section | David Berry / NASA/JPL | From: 3.3.2.8  To: 4.4 |  |
| 3-13 | 3.3.2.8 | 1 | 7 | te | KVN and XML are both ASCII formats | David Berry / NASA/JPL | From: "...instead of using the ASCII text files can..."  To: "...instead of using the KVN text files can..." |  |
| A-1 | Agency Center | 1 | 1 | ed | grammar | David Berry / NASA/JPL | From: "spacecraft, as well as monitoring telemetry..."  To: "spacecraft; and monitoring telemetry... |  |
| A-1 | Apoapsis | 1 | 1 | ed | It is observed that "Periapsis" appears to have been removed from the glossary. If this is true, then apoapsis and other terms related to key characteristics of an orbit should also be removed (e.g., Eccentricity, Inclination, Frame origin, Right ascension of ascending node, etc.). Alternatively, add Periapsis back. | David Berry /  NASA/JPL | Consider. |  |
| A-1 | Attitude Equipment | 1 | N/A | ed | Term is not used in this volume. | David Berry / NASA/JPL | Remove term from Glossary. |  |
| A-1 | Bias | 1 | 1 | ed | change the preposition | David Berry / NASA/JPL | From: "A fixed-offset error of the 'true' value."  To: "A fixed-offset error with respect to the 'true' value." |  |
| A-1 | Doppler | 1 | 1 | ed, te | Change term to "Doppler shift"... it more accurately goes with the provided definition. | David Berry / NASA/JPL | The "Mix" and |  |
| A-1 | Ephemeris | 1 | 1 | ed | An ephemeris doesn't have to be "accurate" (though results are better if they are) | David Berry / NASA/JPL | From: "A list of (accurate) positions and velocitis |  |
| A-1 | Frame origin | 1 | 1 | ed | Term is not used in this volume. | David Berry / NASA/JPL | Remove term from Glossary. |  |
| A-2 | Global Positioning System | 1 | 1 | ed | unnecessary punctuation | David Berry / NASA/JPL | From: "accurate, global"  To: "accurate global" |  |
| A-2 | N/A | N/A | N/A | ed | Between "In situ assets" and "Measurements" there is a big gap | David Berry / NASA/JPL | close the gap |  |
| A-2 | Navigation Session | 1 | 1 | te | Definition doesn't use the term just defined. | David Berry / NASA/JPL | From: "The interchange of data between..."  To: "The interchange of navigation messages between..."  OR  To: "The interchange of navigation data messages between..." |  |
| A-3 | Quaternion | 1 | 2 | te | qualifying phrase | David Berry / NASA/JPL | From: "...convenient mathematical properties but not..."  To: "...convenient mathematical properties for navigation but not..." |  |
| A-3 | Missing Term | N/A | N/A | te | Add "Range" (the "Range Rate" is present, and references the "range", but "Range" is not in the Glossary. | David Berry / NASA/JPL | Add a definition for "range", e.g., "a measured or calculated distance between an observer and a spacecraft" |  |
| A-3 | RINEX | 1 | 1 | ed | Term is not used in this volume. | David Berry / NASA/JPL | Remove term from Glossary. |  |
| A-3 | Tracking Station | 1 | 1 | te | Doesn't allow for space based tracking network. | David Berry / NASA/JPL | From: "Ground-based facility..."  To: "Space or ground-based facility..." |  |
| A-3 | Tracking Station | 1 | 1 | te | Correct the function of the station | David Berry / NASA/JPL | From: "monitor the location of"  To: "communicate with" |  |