

Appendix A

Procedural Guide For Checking JN Sight Folders

- 1 This Procedural Guide contains the information necessary to check Junior Navigation sight folders *prior* to submission to USPS Headquarters. It should be given to the person designated by the squadron to check JN sights.
- 2 Additional copies of this guide should be copied and distributed as needed by the squadron.
- 5 When the sight folder is returned from the national reviewing committee, go over it with the candidate. This procedure will prove helpful to both of you.

Getting Started

- 3 Your assignment is extremely important. How professionally you accomplish it may well determine the success or failure of your squadron's candidates. Sight-folder requirements are part of the learning process; therefore, you are a vital complement to the course instructor. Be prepared to instruct, because in most cases this is necessary. Your interest in the candidate's submission of a successful sight folder should be every bit as keen as is the course instructor's concern that each candidate pass the open-book and closed-book examinations. A candidate cannot attain the grade of Junior Navigator until a successful sight folder has been submitted. It is an equal partner in the triad of requirements.
- 4 If you diligently strive to ensure that each candidate's sight folder is error free, both you and the candidate will be successful. If you make only a half-hearted attempt at checking the folder or simply "sign it off," you are not fulfilling your responsibility to the candidate and are missing an important opportunity to instruct. Check the folder as described below and note all errors. Return the folder to the candidate and point out the errors without explaining how to correct them. Let the candidate try to figure out the correct answers on his own and return the sight folder to you for a second review. If errors remain that the candidate still does not understand how to correct, go over them carefully and provide any explanation necessary. The student should then resubmit the folder to you for a final review before it is sent to Headquarters.
- 6 Do not write or make any marks on the sheets that will be submitted to Headquarters. It will save you a great deal of time and effort in note-taking and sheet-sorting if you require that each candidate furnish you with duplicate copies of each page in the folder. Mark these copies in any way that seems natural to you.
- 7 Begin the checking process by ensuring that the sights are arranged in the order prescribed in the Key to Sights. This will also make it easier for you to follow the *check list* provided on the reverse side of the Key to Sights. If you did not require that the candidate furnish duplicate copies, it will now be necessary to take the folder apart because it is difficult to check the CLS plots accurately while they are bound in the folder. The required Sextant Observations are also found in the front of the Student Manual. It is handy to use this as a step-by-step check. There is no limit on the length of time between the date on which sights were taken and the date of the sight folder submittal. However, if sights were taken more than two years (730 days) prior to the date the original sight folder is received at USPS Headquarters, the sight folder and its contents must conform to the requirements of the current edition of the course, or of an immediately preceding edition (JN89/92) for which the examination and the sight folder requirements have not yet expired. The deadline for submitting sight folders conforming to the requirements of JN89/92 is 31 December 2002. In addition, certain extra materials that are unique to the date of the sight must be included in the sight folder. These materials are to be clearly-readable photocopies of the following pages from the *Nautical Almanac* for the year in which the sight was taken:
 1. The left-hand and right-hand daily pages for

the date (UT) of the sight.

2. If the over-two-year-old sight is of Venus or Mars, the “Altitude Correction Table (10°-90°)” that includes additional corrections for planets (normally on the inside front cover of the Almanac).
3. If the over-two-year-old sight was taken in 1998 or earlier and is reduced by the NASR (Nautical Almanac Sight Reduction) method (applicable to JN89/92), the “NASR Auxiliary Table (Adjustment to Tabular Altitude)” that follows the NASR Sight Reduction Tables in the Almanac.

These extra materials are to be marked on the top right-hand corner of each sheet with the sight number to which they apply. They are to be placed in the sight folder immediately following the sight reduction form for that sight.

The Log

- 8 The log is a record of sights. Data given in the log take precedence over the data shown on sight-reduction forms. The “Remarks” column of the log should be used freely by the candidate to explain any situation that might not be clear to the Examiner.
- 9 Check the candidate’s log. Be sure that the data on the SR forms agree with the data in the log. An error here may lead to erroneous data in the reduction of the sight.
- 10 Ensure that at least the minimum number of sights are logged (25). The candidates are urged to take more than the minimum number of sights required. Not all sights taken must be logged, but more sights may be logged than the minimum number required. The numbers of the sights that are used to fulfill requirements should be circled on the log.
- 11 The line on the log between each run of sights is to be left *blank*.
- 12 For fixes: If intermittent cloud cover interrupts the sight-taking sequence when observing a body, it is permissible to switch to another body and complete that run of sights. Then, if the original body is visible and time permits, the interrupted run of sights can be completed. The sights are to be numbered and logged in the order taken. The line on the sight log between alternating sights is to be left *blank*. “Alternating sights” should be shown in the remarks column.
- 13 If a sight folder fails owing to a disqualified sight, it must be replaced by a sight taken *after* the date of failure unless additional unused sights that will satisfy the requirements appeared on the *original* log.

Sextant Observations

- 14 All sights must be reduced and plotted using the Law of Cosines method of sight reduction.

Sights Required

- 15 One two-body fix; one star sight; one planet sight; one sun sight; one moon sight; one meridian-transit sight of the sun.

Sights to Be Logged

- 16 A *minimum* of 25 sights must be logged.

- Two-body fix: Two runs of three sights.
- Star sight: One run of three sights.
- Planet sight: One run of three sights.
- Sun sight: One run of three sights.
- Moon sight: One run of three sights.
- Meridian-transit sight of the sun: One run of seven sights.

Special Sights

- 17 Junior Navigation allows two kinds of special sights. One allows the use of an artificial horizon and the other allows back sights.

Artificial Horizon

- 18 In Junior Navigation, two single LOPs may be submitted using an artificial horizon. (The fix and meridian transit must be taken using the natural horizon or a dip short of the natural horizon as discussed in Appendix A of the Student Manual.) IC is the only correction to be applied to *hs* to arrive at “2 *ha*.” The “2 *ha*” can be inserted above the *ha* blank on the sight-reduction form and divided by 2 to calculate *ha*. Check column #14 and/or #9 on the sight log form to be certain that it is noted that this is an artificial-horizon sight.

Back Sights

- 19 Back sights are allowed for any LOP. The IC and dip corrections are applied to the *hs* and the sum is subtracted from 180° to calculate *ha* (see Appendix A of the Student Manual).

The Check List

20 The Check List appears on the reverse side of the Key to Sights form. *If you follow this meticulously, the sight folder you are checking will be successful.*

Log

21 **Items #2 through #4.** These items on the Check List pertain to the sight log. These should have already been checked in accordance with the instructions on page 2. If they have not been, check them now. Note instructions on the back of the sight log.

Sight Requirements

22 **Item #5.** Each run must consist of a minimum of three sights on the same body, except that a run of at least seven sights is required for the meridian-transit observation of the sun.

23 **Item #6.** If the body is east of the observer, each succeeding h_s in the run *must be increasing*; if the body is west of the observer, each succeeding h_s *must be decreasing*. If these criteria are not met the run is disqualified. *There is an exception.* If the body is within 10° of the observer's meridian, the change in h_s for each succeeding sight may be so small that this rule is waived.

24 The easiest way for you to determine when a body is within 10° of the observer's meridian is by LHA. If the LHA is 10° or less or 350° or more, or if the LHA is between 170° and 190° , the body is within 10° of the observer's meridian.

25 This rule is not waived for the run of sights used for the meridian-transit observation of the sun. For that run at least three sights must be taken before transit and show consistently increasing altitude. The run must continue through transit and include at least three sights with consistently decreasing altitude.

26 **Item #7.** The time between the two observations for the fix must not exceed 20 minutes.

27 **Item #8.** Using a protractor, measure the smaller angle between the two LOPs to ensure that it is 45° or more. If it is too close to call, calculate the angle.

28 **Item #9.** Check all of the sights to make certain that each H_o is not less than $15^\circ 00.0'$.

29 **Item #10.** The distance from the known position (KP) to the LOP, as determined by the calculated intercept, must not exceed 5 miles. Note that the two LOPs used to determine the fix must each conform to the 5-mile limitation, although the fix itself may be greater than 5 miles from the KP.

30 Conformance to the requirements in **Items 5–10** is mandatory. Any violations result in a disqualification of the sight folder. If you find errors in sight computations, make sure that the corrected values of H_o and Z_n for each sight meet these requirements.

Sight Computations

31 You are now ready for a step-by-step check of the sight-reduction form.

32 **Item #11.** If dip short is used, corrections must be taken from the USPS Dip Short Tables or the calculations made by formula. In either case the computations must be shown on the SR form and checked. Since there are slight differences in the individual tables included in the USPS Dip Short Tables, the candidate should indicate which table was used. Check the arithmetic involved in the conversion of h_s to h_a . If you need a complete review of the dip-short procedures, refer to Appendix A of the Student Manual.

33 If a dip-short sight is used, check to see that the dip-short distance (yards, nautical miles, or statute miles) is in column #14 of the sight log.

34 **Item #12.** Check each item in the Time Box and the arithmetic. The WE and ZD should be correct as transcribed from the log. Before moving on, note if a change in date is necessary. If daylight time is in effect make sure this is noted on the log.

35 Ensure that the IC and height of eye have been transcribed correctly from the log to the sight-reduction form. Using the removable card from the *Nautical Almanac*, or using page A2 of the Almanac, check the dip correction for all bodies. If the HE is 8 feet or less, the dip is taken from the inset at the extreme right and interpolation is necessary if the HE is not directly tabulated. If the HE is 8 feet or greater, the dip correction may be taken from the main column and interpolation is not necessary. If the HE is the same as the entering argu-

ment, the correction immediately above is to be used. See the Almanac page 259, ¶14.

- 36 For an HE over 155 feet, use the formula:

$$D = 0.97\sqrt{HE}$$
 in feet.
- 37 Check the corrections applied to h_a for H_o . The sun, stars, Jupiter, and Saturn require only one correction, mainly for refraction. This is placed in the “Main” box. Venus and Mars require two corrections, one for refraction and one for parallax. The parallax correction for Venus and Mars is found on the inside front cover of the Almanac in the column entitled “Additional Corr.” Make sure that the candidate used the proper month and h_a . If the h_a happens to fall on a tabulated value, use the upper figure as the correction. This additional correction for Venus and Mars is entered in the second block down, “Add’l Moon, Pl.” Junior Navigation does not require an “Add’l Refraction” correction.
- 38 The HP for a moon sight is taken from the daily pages. The moon’s altitude corrections are found on pages xxxiv and xxxv in the back of the Almanac. Use the h_a as the entering argument. The “Main” refraction correction is at the top of the page. Interpolate as necessary. Proceed down the column where you found the main correction using HP and U or L as entering arguments to extract the Additional Correction for the moon. Interpolate if necessary. All of the moon’s corrections are (+), but if the sight is of the upper limb, 30’ must be subtracted.
- 39 **Items #13 & #14.** For star sights, check the SHA in the Almanac. See that the proper whole hour appears in the hour blank and the correct GHA for that whole hour is shown in the blank alongside. Likewise, check that the proper minutes and seconds are shown for the fractional hour in the adjacent blank. Only the moon and planets have a “v” correction. The “v” correction is normally plus except that on occasion Venus will have a (–) correction. The “v” value is found on the daily pages of the Almanac. If the Venus correction is (–) it will be shown there. Go over the arithmetic involved in the computation of GHA, because errors are common. Make sure that W Lo is subtracted from and E Lo is added to the GHA to determine LHA. Recheck the arithmetic to ensure that the LHA is correct.
- 40 Check the Declination Box to ensure that the correct figure is shown and that the proper name N or S is cir-

led. Check the “d” and make certain that when dec is numerically increasing it is (+) and when dec is decreasing it is (–). The “d” correction is found in the tinted or yellow pages.

- 41 **Item #15.** Note any other Almanac error.
- 42 **Item #16.** A complete discussion of the Law of Cosines sight-reduction method is in the Student Manual. It is important that you are meticulous in checking the correctness of the signs given to various entries that require them. Instructions on the sight-reduction form describe the conditions under which a (+) or (–) is assigned.
- 43 **Item #17.** Ensure that Z is calculated correctly, and that Z_n is correctly determined from Z.
- 44 **Item #18.** Note any other error in the use of the Law of Cosines reduction procedure.
- 45 **Item #19.** The time diagram is not a requirement for the JN sight folder. The student should be encouraged to construct a time diagram to check his calculation of hour angles, but it will not be graded.
- 46 **Item #20.** This is for minor errors found and not specifically mentioned elsewhere on the JNSK form checklist.
- 47 The meridian-transit sight of the sun requires only the top portion of the sight-reduction form to be completed; the calculator reduction is not needed. An additional sheet showing calculation of the zone time of transit and calculation of latitude from H_o and declination is required.

Plotting and Labeling

- 48 A separate plot of each LOP and the two-body fix is a requirement. However, there is no plotting requirement for the meridian-transit observation of the sun.
- 49 **Items #21 and #22.** Check to see that the latitude diagonals match the selected Mid-Lat. Inspect the parallels and meridians for correct labeling at 10’ intervals.
- 50 **Item #23.** Check the plotted positions of the KP, EP, and Fix for accuracy. Don’t just “eyeball” the plots—

physically check all measurements of distance, angle, latitude, and longitude with plotting tools.

51 **Item #24.** Check the labeling. The KP is a triangle symbol with no label. Single LOPs are labeled with the zone time of the sight to the nearest minute above the LOP and the name of the body below. The first fix LOP is labeled with the zone time of the sight to the nearest minute followed by a dash, then the zone time of the fix to the nearest minute. This is above the LOP, and the name of the body should appear below the LOP. The second fix LOP is labeled with the zone time of the fix above the LOP and the name of the body below. The fix symbol is a circle and is labeled with the zone time of the fix placed horizontally.

52 **Item #25.** Measure the intercept distance and the azimuth direction. Make certain that the LOP is 90° to the azimuth and that the dashed azimuth line terminates at the LOP. The EP symbol is a square. The KP-LOP distance *must not exceed 5 miles*. For the fix the smaller angle between the LOPs *must be 45° or more*. Check the angle carefully and if it is not clearly $> 45^\circ$ by protractor, calculate it mathematically. The distance between each LOP and the KP must be 5 miles or less; however, the distance between the KP and the fix can exceed 5 miles.

53 **Item #26.** This is for plotting errors not specifically addressed under other Items. An example would be a fix or EP position incorrectly recorded on the CLS form.

The Completed Sight Folder

54 *Leave the SV form unsigned until all corrections are made to your satisfaction.* With uncorrected errors, the sight folder is not ready for submittal. Remember, the error you miss may be a disqualifying one.

55 Ensure that *two* copies of the JNSK form (Key to Sightings) are included and properly filled out.

56 When you are satisfied that the sight folder meets all requirements, sign the SV form and have the candidate make photocopies of the entire folder. In the unlikely event that the folder is lost in the mail, the photocopies will be accepted with the Course Chairman's approval.

Re-Submittal

57 Upon re-submittal, ALL errors and omissions noted must be corrected. For rejected sightings, NEW SR and CLS forms must be attached to the originals. All original work must be returned with the resubmitted folder.

Common Errors

58 The errors most commonly found in sight folders are listed in this section. Some of the errors listed will be immediately apparent; others will not. It cannot be stressed too strongly that the sight folder must be completely verified by the Sight Checker. If each entry and each arithmetic operation is not verified, errors can be overlooked.

59 To be of the greatest service to the candidate, note the location of errors but do not give the correct information or value. By rectifying the error, the candidate will learn and be better able to guard against a repetition of similar errors in the future.

1. Sight folder improperly checked by the squadron.
2. Transcription errors from log to SR form.
3. Computations omitted.
4. Arithmetic errors.
5. Azimuth spread for fixes not within tolerance.
6. Dip/Dip Short errors, tables other than USPS tables used, errors in formula calculation and in the extraction of data from the Almanac.
7. Hour angle of body—incorrect data from NA such as sun for Aries or vice versa, or incorrect date.
8. Reversal of minutes and seconds from yellow pages or wrong yellow or tinted page column used.
9. Log errors.
10. Improper signs for corrections.
11. Incorrect entering arguments for data extraction.

12. Improper column used for sun's "main" correction: Oct-Mar/Apr-Sept.
13. Only one copy of Key to Sights (JNSK) included in the folder.
14. Insufficient sights logged.
15. Incorrect or missing labels on plot.
16. Candidate's name and squadron not on each sheet.
18. Failure to note use of Daylight Saving Time.
19. Runs of sights in which no sequence of three sights showed consistently increasing or decreasing values for h_s (except when the body is within 10° of the observer's meridian).
20. Incorrect sign of "d," especially for moon sights.
21. LOP over 5 miles from the KP.
22. H_o under $15^\circ 00.0'$.
23. Observations for the two-body fix more than 20 minutes apart.