

Procedural Guide

for

Checking N Sight Folders

UNITED STATES POWER SQUADRONS®

Advanced Grades Division

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Changes have been made throughout this text to incorporate the corrections of Update Number 1. Each is indicated by a vertical line in the inner margin. The vertical lines are at the approximate position on the page of each change, which may be in either column or within an illustration.

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Printed in the United States of America
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1504 Blue Ridge Road
P.O. Box 30423
Raleigh, NC 27622
919-821-9281
Fax: 919-836-0813
1-888-FOR-USPS (367-8777)
www.usps.org

Checking Sight Folders

- 1 It is important that each sight folder be checked on a line-by-line basis by a person *qualified* to ensure it will pass. Generally, this should be someone who has successfully submitted a USPS® sight folder in the past, unless the checker is otherwise qualified through experience.
- 2 If no sight checkers are available in the local squadron, the District Educational Officer is suggested as a source to locate someone in a nearby squadron. By identifying and correcting errors at the squadron level before submission of the folder, the student will achieve the satisfaction of receiving a passing grade initially and avoid time and effort of re-submission.
- 3 When the sight folder is returned from the national organization, the sight checker should review any errors with the candidate. This will be instructional for both the candidate and the sight checker.
- 6 Begin the checking process by insuring that the sights are arranged in the order prescribed in the Key to Sights (Form NSK). This will insure compliance and make it easier for you to follow the check list provided on the reverse side of the Key to Sights. Also, note the time limitations associated with sight folder submissions stated in Section 1 of the student manual. Squadron instructors and educational officers are responsible for reviewing these limits as well as any revisions according to the latest EDN. Also, remember that sight folders are to be based on current requirements. When a course is superceded, it's limit will be defined by EDN.

Getting Started

- 4 Do not write or mark 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 ask each candidate to furnish you with machine copies of each page in the candidate's folder. Mark these copies in any way that seems natural to you. The small amount of distortion attendant to the copying process will not bother you in the least.
- 5 To aid in your work, samples of the most recent sight folder forms are included at the end of this guide. These include:

- Form NSK (key to sights submitted)
- Form SV (sight verification, original)
- Form RSV (sight verification, re-submittal)
- Form ED-SL (sight log)
- Form for Meridian Transit
- Two SR Forms (sight reduction)

Your Check List

- 7 Your working document will be the check list located on the reverse side of the NSK form. If you follow it meticulously and ensure that the sight folder complies with its provisions, the sight folder you are checking will be successful. This guide will lead you through the NSK list in sequential order.

Specific NSK Requirements

- 8 The following items are specified on the reverse of the NSK form. Follow these requirements carefully.

The Log

- 9 Items 1–3: note items 1–3 on the check list. Then, carefully study the sample log shown on the back side of form ED-SL with typical entries in columns #1 through #14. Column #14 should be used freely by the candidate to explain any situation that might not be clear to the examiner, such as use of daylight savings time, dip short, etc.
- 10 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.

- 11 Ensure that at least the minimum number of sights are logged (23 for N). Urge candidates to log *all* sights that were taken whether they are reduced or not. The numbers of the sights that are reduced and used to fulfill requirements should be circled on the log. (See ¶¶16 and 17.)
- 12 One line on the log between each run of sights must be left blank.
- 13 For fixes: In the event that intermittent cloud cover interrupts the sight-taking sequence when observing a body, it is okay to switch to another body and complete its run of sights. Then, if the original body is visible and time permits, the interrupted run of sights can be completed. The sights must be numbered and logged in the order taken. One line on the sight log between alternating sights must be left blank. The term, “alternating sights,” should be shown in the remarks column.
- 14 A sight folder will be rejected if a sight is disqualified. Unless additional, unused sights that satisfy the particular requirements are listed on the original log, the disqualified sight must be replaced by a sight taken after the date of the folder’s rejection.

Sextant Observations

- 15 All sights must be reduced by the methods designated in the following paragraphs. A sight reduction sheet (SR) is required for all sights except the meridian transit sight; for the latter, alternately the meridian transit form can be used. For a sight folder to be accepted, each reduction (except the meridian transit) must include fully completed time and meridian diagrams.

16 Sights Required

- a 3-body fix with each Ho no greater than 75°
- a 2-body fix using the arithmetical average of a run of five sights taken within five minutes for each LOP. Each Ho average is to be no greater than 75°
- a meridian transit sight that could have an Ho up to 90°
- a high-altitude sight with an Ho greater than 70° , but no greater than 88°

- 17 **Sights to be logged.** A minimum of twenty-three sights must be logged for a complete sight folder. These are:
- for the 3-body fix, three runs of three sights
 - for the 2-body fix, two runs of five sights
 - for the meridian transit, one sight
 - for the high altitude sight, one run of three sights
- 18 **Sight Reductions and Plotting.** You will need to confirm that sights were reduced and plotted as follows:
- the 2-body and 3-body fixes must be reduced by the Law of Cosines method and by a tabular method. The student may choose which tabular method—Pub 229 or NASR—to use, but the same tabular method must be used throughout the sight folder. Plotting must be done using the selected tabular method.
 - the meridian transit must be reduced and plotted using the special method discussed in Section 3 of the Student Manual.
 - the high-altitude sight must be reduced and plotted using only the Law of Cosines method, that is, no tabular reduction is required

Sight Requirements

- 19 Items 4–13 on the check list should be checked carefully as follows because a lack of conformance will result in a disqualification of the sight folder.
- 20 Item #4: Check the time span between the first and last sight used for the 3-body fix. The elapsed time cannot exceed 15 minutes.
- 21 Item #5: Inspect the Zn for each of the three sights used for the 3-body fix. The azimuth spread between *any two* bodies (i.e., 1st and 2nd, 2nd and 3rd, or 1st and 3rd) must be *no less* than 30° and no more than 150° . To ensure this is the case, check the CLS plotting sheet to see that the smaller angle between *any two* LOPs is, in *all* cases, *not less* than 30° . Do not assume; calculate the difference.
- 22 Item #6: The total time between the first sight of the first run and the last sight of the second run shall not exceed 15 minutes. A sun-moon fix is encouraged; however, any two bodies will fulfill the requirements of this fix.

- 23 Item #7: The Zn difference for the 2-body fix shall not be less than 45° nor more than 135° . Check this arithmetically.
- 24 Item #8: For this 2-body fix only, each run of five sights must be taken when the body is 10° or more from the observer's meridian. Otherwise there would be little or nothing to average. If the LHA of the body is 10° or greater and 350° or less, the body is outside the restricted zone. A sight taken on the lower branch of a circumpolar body is within 10° of the observer's meridian if the LHA is within 10° of 180° .
- 25 Item #9: Neither run of sights in the 2-body fix may exceed five minutes.
- 26 Item #10: Carefully check the sight averaging procedure. The method used for averaging must be arithmetically correct. The method of sight averaging appears in Section 3 of the student manual. Details of the sight averaging computations *must be shown* on a single sheet of paper that is to be included in the sight folder. The averaged WT and hs of each run are used to produce a single SR form for each body.
- 27 Item #11: The distance from the LOP to the actual plotting position may not exceed three nautical miles. Check every intercept a in the Law of Cosines sight reductions to ensure that this is the case. Errors may be found later in the Law of Cosines reductions, but for now assume they are correct. The distance from the actual plotting position to the fix may exceed three miles *if* the distance from the actual plotting position to all LOPs is three miles or less.
- 28 Item #12: The meridian transit sight must be taken within ± 10 seconds of the predetermined transit time. The calculations of the time of meridian transit must be shown. Check these calculations carefully. Any body can be used to fulfill the meridian transit requirements; however, we recommend that the sun be used. The procedures for the meridian transit sight can be found in Section 3 of the student manual.
- 29 Item #13: Ensure that the Ho for the high altitude sight is at least 70° but is not above 88° . This sight needs to be reduced and plotted by the Law of Cosines only.
- 30 Item #14: This is for any errors you may find that are not specifically mentioned elsewhere in the check list. Examples are errors in arithmetic, incorrect methods, etc.
- ## Sight Computations
- 31 Item #15: If the WE and ZD are correct as transcribed from the log, check for careless arithmetic. Before moving on, note if a change in date is necessary. If daylight savings time is in effect *and* has been used, make sure this is noted on the log.
- 32 Ensure that the IC and height of eye have been transcribed correctly from the log to the sight reduction form. Using the removable card or page A2 from the *Nautical 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 identical to the entering argument, the correction immediately above must be used. See the *Nautical Almanac*, page 259, ¶14. For an HE over 155 feet, use the formula: $D = 0.97$ times the square root of HE (in feet.)
- 33 Item #16: If dip short is used, corrections can be taken from the USPS Dip Short Tables included with the Student Manual or the calculations can be made by formula. In either case the computations must be shown on the SR form and checked. After dip and IC have been checked, check the arithmetic involved in the conversion of hs to ha.
- 34 If dip short sights are used, check to see that the dip short distances, with units of measurement, are shown in column #14 of the sight log.
- 35 Items #17 through #19: Check the main correction of each body at this time. If Venus or Mars has been used, be sure the proper additional corrections have been entered, if applicable. For the sun's main correction, make sure the proper column for month and for upper or lower limb has been used.
- 36 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 *Nautical Almanac*. Using ha as the entering argument, the "main" refraction correction is found 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.
- 37 Check the arithmetic carefully. Errors in addition and subtraction are common.
- 38 If the Ho is less than 15°, see that the proper T&B corrections have been inserted. The temperature and pressure must be noted on the sight log in the remarks column. The corrections may be taken from page A4 in the *Nautical Almanac* or from *Bowditch*, 1995, Tables 27 and 28, or from *Bowditch*, 1981, (Vol II) Tables 23 and 24. The candidate must show, on the SR form, the method used.
- 39 If you are checking a star sight, verify the SHA in the *Nautical Almanac*. See that the proper whole hour appears in the hour blank and the correct GHA for that whole hour is shown in its blank. Likewise, check that the proper minutes and seconds are shown for this fractional hour in the adjacent blank.
- 40 Only the moon and planets have a "v" correction. The "v" correction is normally (+), except that on occasion, Venus will have a (-) correction. The "v" value is found on the daily pages of the *Nautical Almanac*. If the Venus correction is (-) it will be shown there.
- 41 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.
- 42 Check the Declination Box to ensure that the proper name "N" or "S" has been circled. Make certain that the correct sign is shown for "d." If the declination is increasing it is (+); if the declination is decreasing it is (-). This is *declination*, not "d." The "d" correction is found in the tinted or yellow pages.
- 43 Item #20: In item 12, above, you determined if the calculation of the time of meridian transit was correct and if the sight was taken within 10 seconds of the computed time. Carefully check the computation of latitude. If the moon or a planet is used, be sure that the accurate "v" correction is included.
- 44 The entire calculation of latitude must be shown either on the form when using the meridian transit form or on a separate work sheet when using the SR reduction form. Corrections to hs to get Ho, and the determination of declination at the time of the sight must be included.
- 45 Item #21: A complete discussion of the Law of Cosines method of sight reduction is shown in the student manual. Review these pages even if you have taken Navigation recently.
- 46 Be sure that the entries for LHA, L, and Dec are correctly converted to decimal degrees and have been rounded to 5 decimal places. *Repeat the arithmetic*. Errors here can be costly.
- 47 Check the "names" of latitude and declination for the correct indication of "N" or "S."
- 48 Check for the inclusion of a negative (-) sign when required.
- 49 Ensure that the full precision value of Hc has been entered in the calculator. Check carefully the conversion from Sin Hc to Hc.
- 50 Look for arithmetic errors in finding the difference between Hc and Ho. Check the intercept "toward" or "away."
- 51 Be sure that Z has been correctly converted to Zn.
- 52 Item #22: When using Pub. 229, a serious error occurs when LHA is converted to Tab LHA by the improper use of assumed longitude. Remember that the Asm Lo must be within 30.0' or less from the DR. The same rule applies to Asm L. An excellent check here is to subtract the actual DR Lo from the actual GHA. If this results in GHA minutes of arc over 30.0', then round off to the next greater value. Examples:
- | | |
|---|---|
| <p>GHA 261° 56.3'</p> <p>DR Lo <u>60° 29.2' W</u></p> <p> 201° 27.1'</p> <p>Round to 201°</p> | <p>GHA 261° 59.3'</p> <p>DR Lo <u>60° 29.2' W</u></p> <p> 200° 30.1'</p> <p>Round to 201°</p> |
|---|---|

- 53 Check that Dec and Dec increment, Asm L, and Tab LHA have been correctly transcribed to the box for Pub 229 computations.
- 54 Using these tabular data, check tabular entries for Tab Hc; “d” and sign; Z diff and sign. Note if DSD corrections are required, and if so, that DSD has been applied. (If DSD is used when not necessary, there is no penalty unless the correction is in error.)
- 55 If all entries are correct, turn to the inside front or back cover and check the d_1 and d_2 corrections. A common error is the wrong sign (+ or -) or Z correction.
- 56 Carefully check arithmetic, the direction of intercept “a”, and the conversion of Z to Z_n .
- 57 Item #23: A complete dissertation of the NASR method of sight reduction is shown in Section 1 of the student manual. Instructions are provided at the top of each page that describe the conditions under which a (+) or (-) is assigned. However, you may find the “rules” for signs in the student manual easier to follow.
- 58 Check that the candidate has correctly computed Asm L and Asm LHA, and that both are rounded to the nearest whole degree on the sight reduction form. Ensure that the difference between the Asm Lo and the DR (KP) Lo is 30' or less.
- 59 When extracting A, B, and Z_1 be sure you check the signs of B and Z_1 . Check the sign of Dec. At this time determine that F is the *algebraic* sum of B and Dec.
- 60 Be sure that the correct degree values of A and F have been used to enter the sight reduction tables to find H, P, and Z_2 .
- 61 Determine that the sign of Z_2 is correct.
- 62 Care is necessary in the use of the Auxiliary Table to determine the correction for minutes of F and A. Values for whole degrees of P are in the left column, while values for whole degrees of Z_2 are in the right column.
- 63 Note the signs of $corr_1$ and $corr_2$. Algebraically combine corrections 1 and 2 with H to obtain Hc.
- 64 Item #24: Algebraically combine Z_1 and Z_2 to obtain Z. Z is used with a one-place decimal in computing Z_n . The final answer for Z_n is then rounded to a whole degree.
- 65 Item #25: Any other error not specifically mentioned.

Diagrams: Time & Meridian

- 66 Item #26: Check the time diagram for correctness and accuracy. The sun must be located on each diagram. Aries, stars, planets, and the moon are plotted by GHA. The sun is plotted by UT for all sights including the sun. After locating Aries, a star may be plotted by SHA. The LHA on the time diagram should agree with the computed value. Use a protractor to measure *all* angles.
- 67 Item #27: Meridian diagram errors are common and will be penalized. On each diagram check every line and measurement; one error could ruin the whole diagram. The body must be located by the intersection of the parallel of altitude and the parallel of declination. The hour circle and the vertical circle should be drawn through this intersection. If arcs are neatly drawn, the Z_n and LHA will be within tolerances. Remember, we use arcs of circles, not ellipses, so complete accuracy is not often achieved. With high values of altitude (or declination), the consequence of using circular arcs may result in Z_n and LHA values that differ several degrees from those produced by the LOC, PUB 229, or NASR sight reduction process. *Make sure* the diagram is complete as shown in Section 5.
- 68 Check the celestial equator by latitude from Z.
- 69 Check the elevated pole and polar axis.
- 70 Check the declination N or S.
- 71 Check the vertical circle. It should go through three points: zenith (Z), the body, and the nadir (Na).
- 72 Check the hour circle. It should go through three points: the two celestial poles (Pn and Ps) and the body.
- 73 Check the parallel of altitude by measuring along the meridian. It should agree with Ho.

74 Measure the azimuth angle and azimuth along the meridian and make sure that the vertical circle is placed correctly with the construction line in the proper direction.

Plotting and Labeling

75 Items #28 through #34: Review plotting methods and symbols. Check each plot as you move along to make certain that all details have been included on the plot.

76 Item #28: Photocopies of SR and CLS forms are not acceptable. Although originals are preferred for the meridian transit and SL forms, clearly legible copies will be accepted.

77 Item #29: Check the L and Lo plotted for the position of the KP.

78 Item #30: Ensure that the LOPs are accurate within $\frac{1}{2}$ mile or 1° .

79 Item #31: With the plot and SR form side by side, see that the secants of latitude (latitude diagonals) match the mid-lat as designated for the plot.

80 Item #32: Check the intercept a for direction and distance. Make sure that the LOP is *exactly* 90° to the intercept. The intercept should be a dashed line, the LOP a solid line.

81 Be sure that the 3-body fix has been plotted in the center of the triangle formed by the three LOPs and is labeled only with the zone time of the fix, horizontally. The 2-body fix is labeled horizontally at the intersection of the LOPs. For a single LOP, be sure that the EP symbol is correct and has been plotted at the foot of a perpendicular from the DR to the LOP. See the student manual for plotting and labeling procedures. The coordinates of the EP or fix should be entered at the bottom of the CLS sheet.

82 Item #33: Check *all* labels. The KP is indicated by an equilateral triangle and is used for a known position. The KP does *not* carry a time label. Each LOP is labeled with the zone time above and the name of the body below. On a fix, make sure that the zone time for each LOP is advanced to the time of the fix. The fix is labeled with the zone time of the fix placed horizontally. See the student manual for illustrations.

83 For a meridian transit by the GHA method, the plot is a line of latitude. Make sure that the EP is plotted and the coordinates are listed at the bottom of the CLS sheet.

84 Item #34: Ensure that plots are accurate and neat.

85 Item #35: Note any other errors you may detect.

86 On completion: Only when the sections listed above are complete and correct to your satisfaction should you sign the SV form.

87 With uncorrected errors, the folder is *not* ready for transmittal to Headquarters. Ensure that two NSK forms (Key to Sights) are properly filled out and included in the folder.

88 It is a good idea for you to urge the candidates to duplicate their entire sight folders after you pronounce them error-free. In the unlikely event that a sight folder is lost in the mail, the duplicate may be submitted to fulfill the sight folder requirements, with the National Course Committee Chairman's permission.

89 Re-submittal after rejection: Upon re-submittal, *all* errors and omissions noted must be corrected. For rejected sights, *new* SR and CLS forms must be attached to the originals.

Common Errors

90 The errors most commonly found in sight folders are listed in the order of the frequency of occurrence. Some of the errors listed will be immediately apparent; others will not. It cannot be stressed too strongly that you, the sight checker, must completely verify the sight folder. If each entry and each arithmetic operation is not verified, you may overlook errors.

91 To be of the greatest service to the candidate, note the location of errors, but do *not* provide correct information or values. By requiring the candidate to rectify the error, he or she will learn and be better able to guard against a repetition of similar errors in the future.

92 The errors most common to sight folders are :

1. Sight folder was not properly reviewed nor checked by the squadron (§§1, 2, 3)
2. Transcription errors from log to DR form (§10)
3. Computations omitted (various §§)
4. Arithmetic errors (various §§)
5. Azimuth spread for fixes out of tolerance (§§21, 23)
6. Dip/dip short errors, tables other than USPS tables used, errors in formula calculation and in the extraction of data from the *Nautical Almanac* (§33)
7. Incorrect H_a of body due to incorrect data from the *Nautical Almanac*; e.g., sun for Aries or vice versa, or incorrect date
8. Reversal of minutes and seconds or wrong page column when extracting values from yellow (or tinted) NA pages
9. Log errors (§§9–13)
10. Improper signs for corrections (§§40, 42, 55)
11. Incorrect entering arguments for data extraction (§§32–40)
12. Improper column used for sun's "main" correction: UL vs. LL or wrong column for month (Sight Computations)
13. Only one copy of Key to Sights (NSK) was included in folder (§87)
14. Insufficient sights logged (§§11, 17)
15. Incorrect or missing labels on plot (§82)
16. Candidate's name and squadron not on each sheet
17. Failure to note use of daylight savings time (§9)
18. Conversion of $\sin H_c$ to H_c incorrect (§49)
19. Run of sights not averaged as specified in the student manual (§§22–26)
20. Meridian diagram incorrect or incomplete (§§67–74)
21. LOP over three miles from actual plotted position (§27)
22. Conversion of degrees and minutes to decimal degrees were incorrect when using the Law of Cosines (§46)
23. One or more sights for fixes with H_o out of tolerance (§16)
24. Sights for fixes cover a time span greater than 15 minutes (§§20, 22)
25. Meridian transit sight taken over 10 seconds from the computed time of transit (§28)
26. Errors in Asm L or Asm Lo (§52)

UNITED STATES POWER SQUADRONS®
 ADVANCED GRADES DIVISION
 NAVIGATION COMMITTEE

_____ (Candidate)

_____ (Squadron)

KEY TO SIGHTS SUBMITTED

Sight No.	Requirement	Body	Sight No.	Requirement	Body
	Three Body Fix			Two Body Fix	
					High Altitude Sight
				Meridian Transit	

SIGHT MARKING SYMBOLS

	<u>SYMBOL</u>	<u>ORIGINAL</u>	<u>RESUBMITTAL</u>
Penalized Error	X	Red	Blue
Nonpenalized Error	⊗	Red	Blue
Dependent Error, not penalized	⊙	Red	Blue
Correct or Corrected	✓	Green	Green

RESUBMITTAL OF SIGHTS THAT DID NOT PASS

- ALL ERRORS MUST BE CORRECTED.** This includes items red-checked in the sight folder, those marked on the check list (on the back of this Form) and those noted under additional comments. Do NOT erase the examiner's check marks or notations when correcting. Those sheets or plots which must be redone have a red line drawn diagonally across the page.
- Sights marked "disqualified" may not be corrected nor resubmitted. They must be replaced by new sights, either from among those already included in the Sight Log as submitted or by entirely new sights taken later than the date of the did not pass notice.
- The entire contents of the original sight folder must be returned. In addition, two new Key to Sight Forms will be provided and they must be filled out and included.
- Sights shall be resubmitted in accordance with the current Educational Department Notice. Note carefully the specified limitations on time allowed for resubmitting.

THIS SIGHT FOLDER PASSED _____

DID NOT PASS _____

Date _____

_____ (Chairman, Navigation Committee)

CHECK LIST

NSK 98

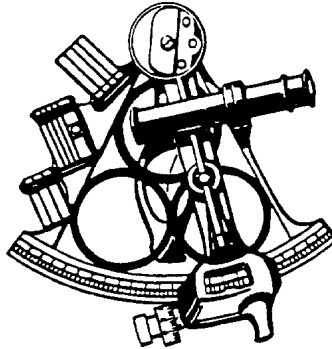
ITEM DESCRIPTION	3-BODY FIX			2-BODY FIX		OTHER	
	1	2	3	1	2	M Tr	Hi A
FORMS:							
Machine copies of USPS® SR and CLS Forms = nonacceptable Folder							
LOG:							
1. Incomplete or contains error(s)							
2. Sight data disagrees with log							
3. Insufficient sights logged							
SIGHT REQUIREMENTS:							
4. LOPs for 3-body not within 15 min of each other							
5. Zn differences for 3-body less than 30° or more than 150°							
6. Total time between 1st and last sights of 2-body runs more than 15 min.							
7. Zn difference for 2-body less than 45° or more than 135°							
8. Sight(s) for run(s) within 10° (hour angle) of observed meridian							
9. Sights for run(s) more than 5 min.							
10. Error in sight averaging (2-body)							
11. LOP(s) more than 3.0 miles from known position							
12. Meridian Transit sight not within +/- 10 seconds of transit							
13. High Altitude Sight less than 70° or more than 88° (Ho)							
14. Other							
SIGHT COMPUTATIONS:							
15. Nautical Almanac error(s)							
16. Dip short computations are wrong and/or omitted							
17. Wrong sign applied to 'v' and/or 'd' correction							
18. T&B computations omitted or incorrect (Ho under 15°)							
19. Error(s) in computing LHA and/or computations missing							
20. Incorrect latitude computations (Meridian Transit)							
21. Error(s) in use of Law of Cosines method							
22. Error(s) in use of Pub 229 Tables							
23. Error(s) in use of NASR Tables							
24. Error(s) in converting Z to Zn							
25. Other							
DIAGRAMS - TIME, CELESTIAL MERIDIAN							
26. Time Diagram error(s) or diagram not used							
27. Plane of Celestial Meridian Diagram incorrect/omitted							
PLOTTING AND LABELING:							
28. None or duplicated copy of USPS® form							
29. Not in agreement with computations							
30. LOP inaccurate by more than 1/2 mile or 1°							
31. Diagonals do not match Mid-Lat or inaccurate							
32. EP, Fix and or Known Position omitted/incorrectly plotted							
33. Improper or absent labels and/or symbols							
34. Inaccurate or careless plotting							
35. Other							
RESUBMITTALS:							
36. Previous errors not corrected							

UNITED STATES POWER SQUADRONS®

SAIL & POWER BOATING

ADVANCED GRADES DIVISION

JN



N

Candidate's Name _____ Squadron _____

Certificate Number _____

EACH STATEMENT THAT APPEARS BELOW IS TO BE SIGNED BY THE COURSE INSTRUCTOR OR HIS DELEGATE.....

- I. (JN only) I have been present when the candidate named above has taken observations with a navigator's sextant and in my opinion he is capable of properly using and caring for this instrument.

Signature and Grade _____ Squadron Position* _____

- II. (JN and N) I have carefully checked the sights in this folder and believe that they meet the requirements and rules stated in the Student Manual, that the work is accurate and neat, and that the data on the work sheets agree with the data in the log.

Signature and Grade _____ Squadron Position* _____

Course Instructor's Signature _____

- * "Squadron Position" refers to educational duties, e.g. CH/LB/AG, Assistant Instructor, Sight Checker, etc.

(Submit one signed copy of this form with the Sight Folder)

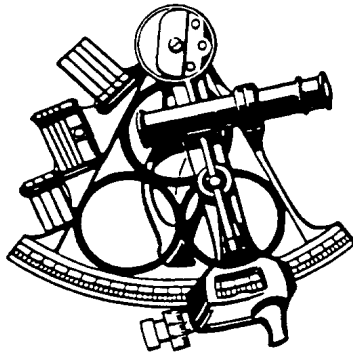
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UNITED STATES POWER SQUADRONS[®]

SAIL & POWER BOATING

ADVANCED GRADES DIVISION

JN



N

Candidate's Name _____ Squadron _____

Certificate Number _____

EACH STATEMENT THAT APPEARS BELOW IS TO BE SIGNED BY THE COURSE INSTRUCTOR OR HIS DELEGATE.....

ONE SIGNED COPY OF THIS FORM IS TO ACCOMPANY EACH RESUBMITTED SIGHT FOLDER

I have carefully checked this sight folder and believe that all the conditions specified in the "Key to Sights" form have been met including the rules with regard to "Resubmittal of Sights that Did Not Pass:"

Signature and Grade _____ Squadron Position* _____

Course Instructor's Signature _____

* "Squadron Position" refers to educational duties, e.g. CH/LB/AG, Assistant Instructor, Sight Checker, etc.

(Submit one signed copy of this form with the Sight Folder)
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INSTRUCTIONS FOR THE USE OF THE SIGHT LOG AND A SAMPLE SIGHT LOG

USPS SIGHT LOG			CANDIDATES NAME				SQUADRON					PAGE NO.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14
No.	Date	Body	WE m-s	ZD	Watch Time h-m-s	hs	Approx Brig.	Hor	HE ft	IC	DR Lat	DR Long	Remarks
	1983												
1	2 Aug	Jupiter	f 0-09	+5	20-17-26	28° 09.0'	SW	NH	6.0	-0.5'	41° 43.1' N	82° 40.0' W	3 body fix
2	"	"	"	"	20-17-51	28° 07.8'	"	"	"	"	"	"	"
3	"	"	"	"	20-18-22	28° 05.2'	"	"	"	"	"	"	"
4	3 Aug	Sun LL	f 0-10	+5	12-34-47	66° 59.8'	S	NH	5.5	+0.2'	41° 43.1' N	82° 40.0' W	Transit

The Sight Log is to be used as the "Log of Record." Once this log is submitted, it is the official Log and cannot be modified or added to except with NEW sights taken after the return of the log by the committee upon rejection of the Sight Folder. As the log is considered primary data, it will be considered correct if there is disagreement between the Sight Reduction sheets and the Log.

Fill in the items as described below and as illustrated in the sample log above. If there is no applicable data, leave the space blank or use a dash, not a zero. Ditto marks are acceptable for the second and subsequent entries within a string of sights.

1. Number all sights chronologically and consecutively. Use this number in all forms, plotting sheets, and additional work sheets. Circle the number of the sight reduced and submitted. Also, for submissions where sights are averaged before reduction, circle the number of each sight used for averaging. Leave a blank line between each run of sights. Draw a double red line in the space immediately following your last log entry to signify completion of your current log data.

2. Show the year on an otherwise blank line; if more than one page is used, show the year at the top of this column on each. Give the day and month in that order and identify the month by its first three letters, not its number.

3. The name, not the symbol, of the body shall be used; if sun or moon, indicate UL or LL.

4. Watch error, either fast or slow, if no error, show 0-00.

5. This is the ZD of the reference meridian.

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6. WT is to be entered as 24 hour time only.

7. The altitude read from the sextant before corrections are applied.

8. Approximate bearing, accurate only to cardinal or inter-cardinal point, e.g., S, SW, NE, etc. Approximate degrees are acceptable.

9. State whether the horizon is natural (NH), artificial (AH), or dip short (DS). If dip short, see instructions that accompany the USPS Dip Short Tables (DS-84).

10. Indicate height in meters and tenths of meters or feet and tenths of feet, not inches, e.g., 6.5 not 6 ft 6 in or other descriptions.

11. The sextant index correction and whether (+) or (-). If none, show 0.0'.

12. The latitude coordinate of your known position or DR.

13. The longitude coordinate of your known position or DR.

14. Any information which will help in understanding the circumstances under which sights were taken should be noted here. If the ZD used for timing sights was different from the standard ZD for the DR or KP Lo, note this here (e.g., Daylight time, UT). If an artificial horizon was used, note the type of device used and whether sun or moon altitudes were obtained by superimposition of images. For dip short sights, note distance to the far shore. Note sextant instrument error, if any. For sights taken at sea note means used to fix the vessels position.

USPS[®] SIGHT REDUCTION FORM

SR 96a



Name _____

Squadron _____

TIME	SIGHT DATA	ALTITUDE		
Date _____	Sight No. _____	Ht of eye _____ ft		
WT _____	Body _____	hs _____		
WE ^{f-} _{s+} () _____	DR L _____ N S E W	(+) (-)		
ZT _____	DR Lo _____ W	IC <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td style="width:50px; height:20px;"></td><td style="width:50px; height:20px;"></td></tr></table>		
ZD ^{E-} _{W+} () _____		Dip <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td style="width:50px; height:20px; text-align:center;"> </td><td style="width:50px; height:20px;"></td></tr></table>	 	
 				
UT _____		Total <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td style="width:50px; height:20px;"></td><td style="width:50px; height:20px;"></td></tr></table>		
G Day/Mo _____		Corr () _____		
ALMANAC --- LHA		ha _____		
SHA ★ _____		HP () _____		
GHA _____		(+) (-)		
____ hr _____		Main <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td style="width:50px; height:20px;"></td><td style="width:50px; height:20px;"></td></tr></table>		
____ m ____ s _____		Add'l () , PI <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td style="width:50px; height:20px;"></td><td style="width:50px; height:20px;"></td></tr></table>		
v () _____		UL () -30.0' <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td style="width:50px; height:20px; text-align:center;"> </td><td style="width:50px; height:20px;"></td></tr></table>	 	
 				
v corr () _____		Add'l Ref <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td style="width:50px; height:20px;"></td><td style="width:50px; height:20px;"></td></tr></table>		
Tot GHA _____	Dec _____ hr _____ N S	Total <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td style="width:50px; height:20px;"></td><td style="width:50px; height:20px;"></td></tr></table>		
DR Lo () _____ E W	d () _____	Corr () _____		
LHA _____	d corr () _____	Ho _____		
	Dec _____ N S			

INTERCEPT and AZIMUTH by the LAW of COSINES METHOD

Enter Lat as positive. (From above) (Use for Law of Cosines)

If Lat/Dec contrary name enter Dec as negative.

Convert LHA, Lat, and Dec to 5 place rounded decimal degrees.

Round Zn to whole degrees.

LHA _____	N S	-----> LHA _____
Lat _____	N S	-----> Lat (+) _____
Dec _____	N S	-----> Dec () _____

$(\cos LHA \times \cos Lat \times \cos Dec) + (\sin Lat \times \sin Dec) = \sin Hc$ ----> **Hc** _____

$(\sin Dec - (\sin Lat \times \sin Hc)) \div (\cos Lat \times \cos Hc) = \cos Z$ -----> **Z**

N	_____	E
S	_____	W

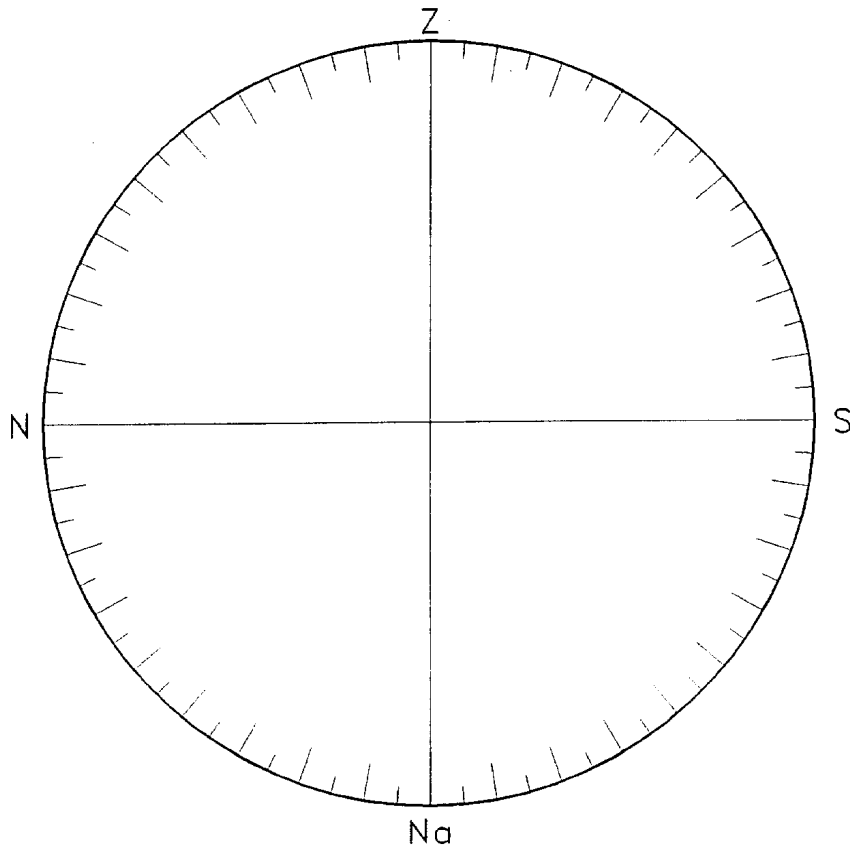
Hc _____

Ho _____ (From above)

a _____ nm **T** Ho > Hc....toward
A Hc > Ho....away

Zn _____

PROJECTION ON THE PLANE OF MERIDIAN



DIP SHORT SIGHTS

State units used

HE _____

DISTANCE _____

DIP SHORT INTERPOLATION

HE			
Dist			

DIP SHORT ALTERNATE METHOD

Enter d in yards, h in feet

$$Ds = 0.0002052d + 1146 h/d$$

SHOW ANY REQUIRED COMPUTATIONS BELOW

INTERCEPT and AZIMUTH by the NAUTICAL ALMANAC SIGHT REDUCTION TABLES

Calculation of Asm Lo and Asm LHA

Tot GHA _____ ° _____'

ASM Lo () _____ ° _____' E
W

ASM LHA _____ °

Advance/Retire AP

Time _____

Speed _____

Dist. _____

Asm L _____ ° N
S Asm LHA _____ °

A _____ ° _____' B () _____ ° _____' Z₁ () _____ °

Dec () _____ ° _____' N
S

F () _____ ° _____'

A _____ ° F _____ °

H _____ ° _____' P _____ ° Z₂ () _____ °

corr 1 () _____' (F' _____, P' _____)

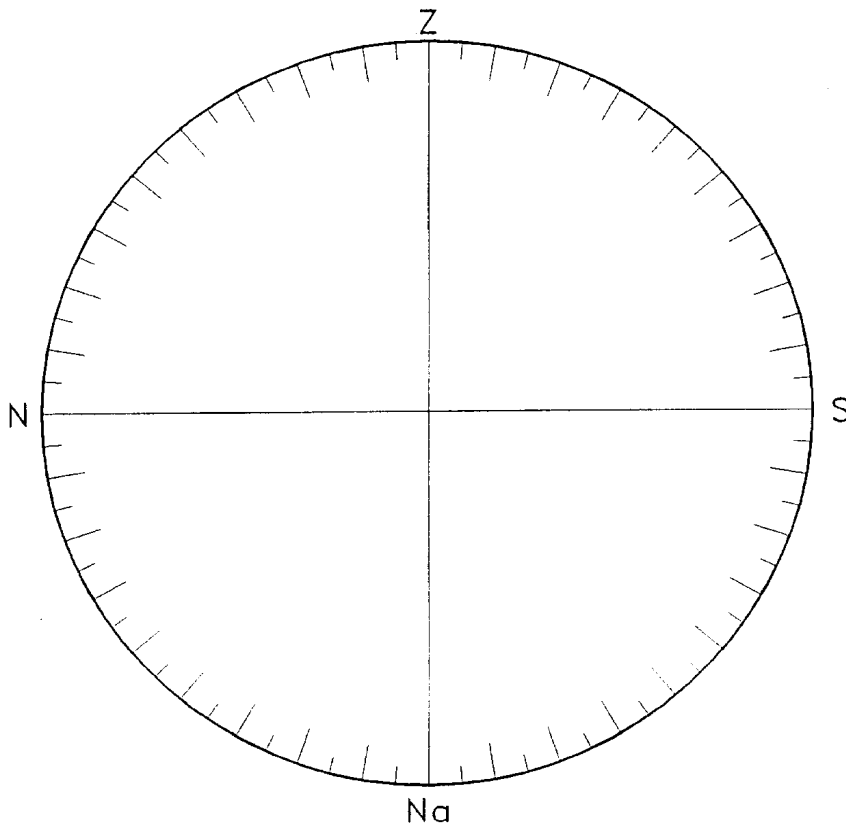
corr 2 () _____' (A' _____, Z₂' _____)

Hc _____ ° _____' Z N _____ ° E
S _____ ° W

Ho _____ ° _____'

a _____ nm T Ho > Hc....toward
A Hc > Ho....away Zn _____ °

PROJECTION ON THE PLANE OF MERIDIAN



DIP SHORT SIGHTS

State units used

HE _____

DISTANCE _____

DIP SHORT INTERPOLATION

HE			
Dist			

DIP SHORT ALTERNATE METHOD

Enter *d* in yards, *h* in feet

$$D_s = 0.0002052d + 1146 h/d$$

SHOW ANY REQUIRED COMPUTATIONS BELOW

Pub 229

Calculation of Asm Lo and LHA

Tot GHA _____ ° _____'

Asm L _____ ° N
S

ASM Lo () _____ ° _____' E
W

Dec _____ ° N S Dec Incr _____'

DEC and LAT
SAME or CONTRARY NAME

LHA _____ °

d () _____' DSD _____' Z diff () _____ ° Tab Z _____ °

Tab Hc _____ ° _____'

*d*₁ corr () _____'

Z corr () _____ °

*d*₂ corr () _____'

Tot corr () _____'

DSD corr (+) _____'

Z N _____ ° E
S _____ ° W

Hc _____ ° _____'

Tot corr () _____'

Ho _____ ° _____'

a _____ miles

T Observed greater - Toward
A Computed greater - Away

Zn _____ °