N 99

Instructor Manual Update Number 1

for

Navigation 99

August 2000

This packet contains **Update Number 1** for Navigation Instructor Manual N 99. This Update Packet consists of these instructions, 3 sheets listing 24 changes, and 8 replacement pages (3 of which are blank).

Instructors should install this Update Packet and become familiar with the changes and any updates to the Student Manual prior to the first session of the class.

The following sheets contain instructions to make the changes. As each change is made and verified, check it off on the sheet.

After all changes are made, the sheet listing these changes should be inserted behind the cover page of the manual for reference, if needed.

UNITED STATES POWER SQUADRONS®

Navigation Committee

IM Update No. 1 for N 99
August 2000

Change #	Section	Page	Column	Paragraph	Line	Change
☐ 1	2	2–3		Question 6		Change the question to read: "For Pub 229, a DSD correction may be needed for high altitudes. How will this will be identified in the tables?"
☐ 2	2	2–3		Answer 6		Change to: "By italicizing d and printing a dot immediately after it. {¶95}"
☐ 3	2	2–5	1	Answers, Pub 229 Method	5	Change "KP-LOP" to "DR-LOP"
☐ 4	2	2–5		Answers, Pub 229 Method	7	Change problem #1 answer for Zn to: "034°"
☐ 5	2	2–5		Answers, Pub 229 Method	7	Change problem #2 answer for Zn to: "227°"
☐ 6	2	2–5		Answers, Pub 229 Method	7	Change problem #3 answer for Zn to: "048°"
☐ 7	2	2–5		Answers, Pub 229 Method	7	Change problem #4 answer for Zn to: "300°"
☐ 8	2	2–5		Answers, Pub 229 Method	7	Change problem #5 answer for Zn to: "086°"
☐ 9	2	2–5	1	Answers, Nautical Almanac Method	5	Change "KP-LOP" to "DR-LOP"

[*continued*]

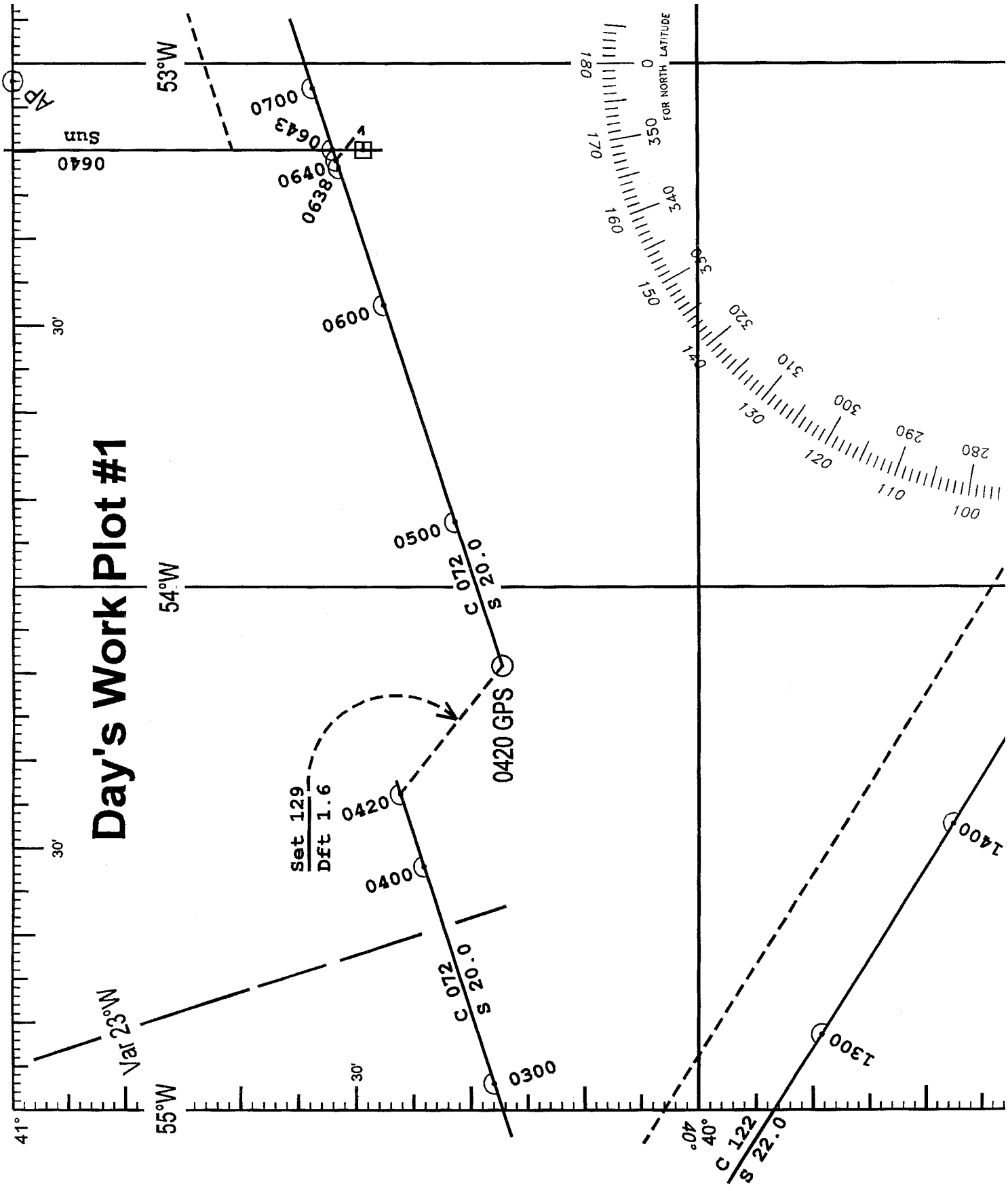
Change #	Section	Page	Column	Paragraph	Line	Change
☐ 10	3	3–5		Problem 3	1	Change “Section 2, Part 3” to “Section 3, Part 3"
☐ 11	5	5–5		Figure 1–b		Change “Dec 60° W” to “Dec 60° N”
☐ 12	5	5–5		Figure 1–b		Change vertical and hour circle construction lines from solid to dashed
☐ 13	6	6–4		Question 4	2–3	Change “JN-N course Nautical Almanac Excerpts” to “Excerpts from the 199X Nautical Almanac”
☐ 14	6	6–5		Question 5	3	Change “JN-N course Nautical Almanac Excerpts” to “Excerpts from the 199X Nautical Almanac”
☐ 15	6	6–12	L	Problem 5	2	Change “WT 14–53–22” to “WT 14–53–32”
☐ 16	6	6–12	R	Problem 5	7	Change “EqT UT 00 hr = 00–21 sec” to “EqT UT 00 hr = 00–31 sec”
☐ 17	7	7–3		Problem 3	1	Change “equator” to “horizon”
☐ 18	13&14	13&14–5 through 13&14–10				Remove
☐ 19	13&14	13&14–5 through 13&14–10				Insert pages 13&14–5 through 13&14–10, Update No. 1, Aug 2000
☐ 20	15	15–3 and –4				Remove
☐ 21	15	15–3 and –4				Insert pages 15–3 and –4, Update No. 1, Aug 2000
☐ 22	15	15–7		Ques. 42	2nd on page	Change “The Equation of Time is (+) 0m 39s” to “The equation of time is (+) 03m 39s”
☐ 23	Sight Check Guide	2	R	18	10	Change “done using the Law of Cosines.” to “done using the selected tabular method.”

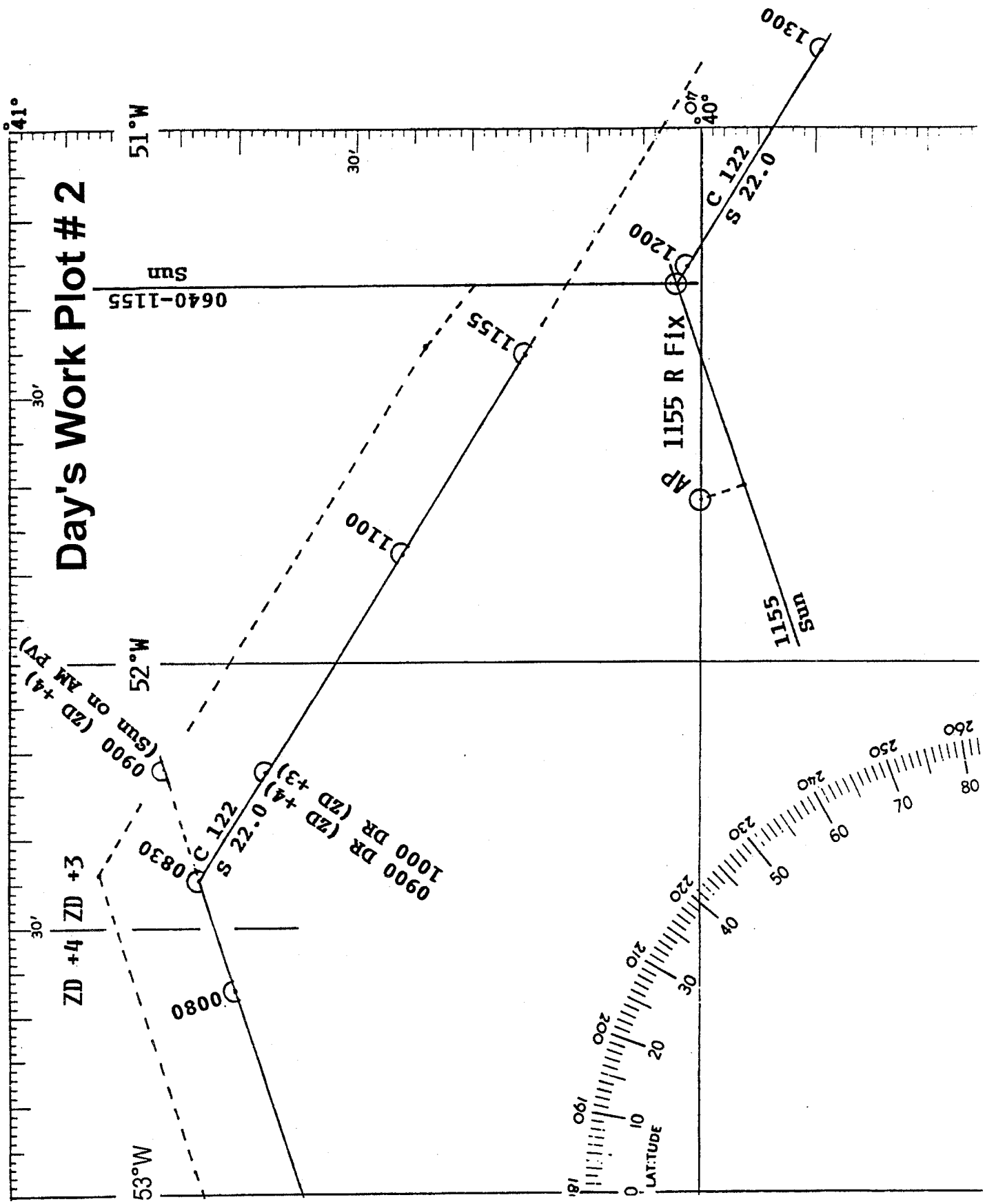
[*continued*]

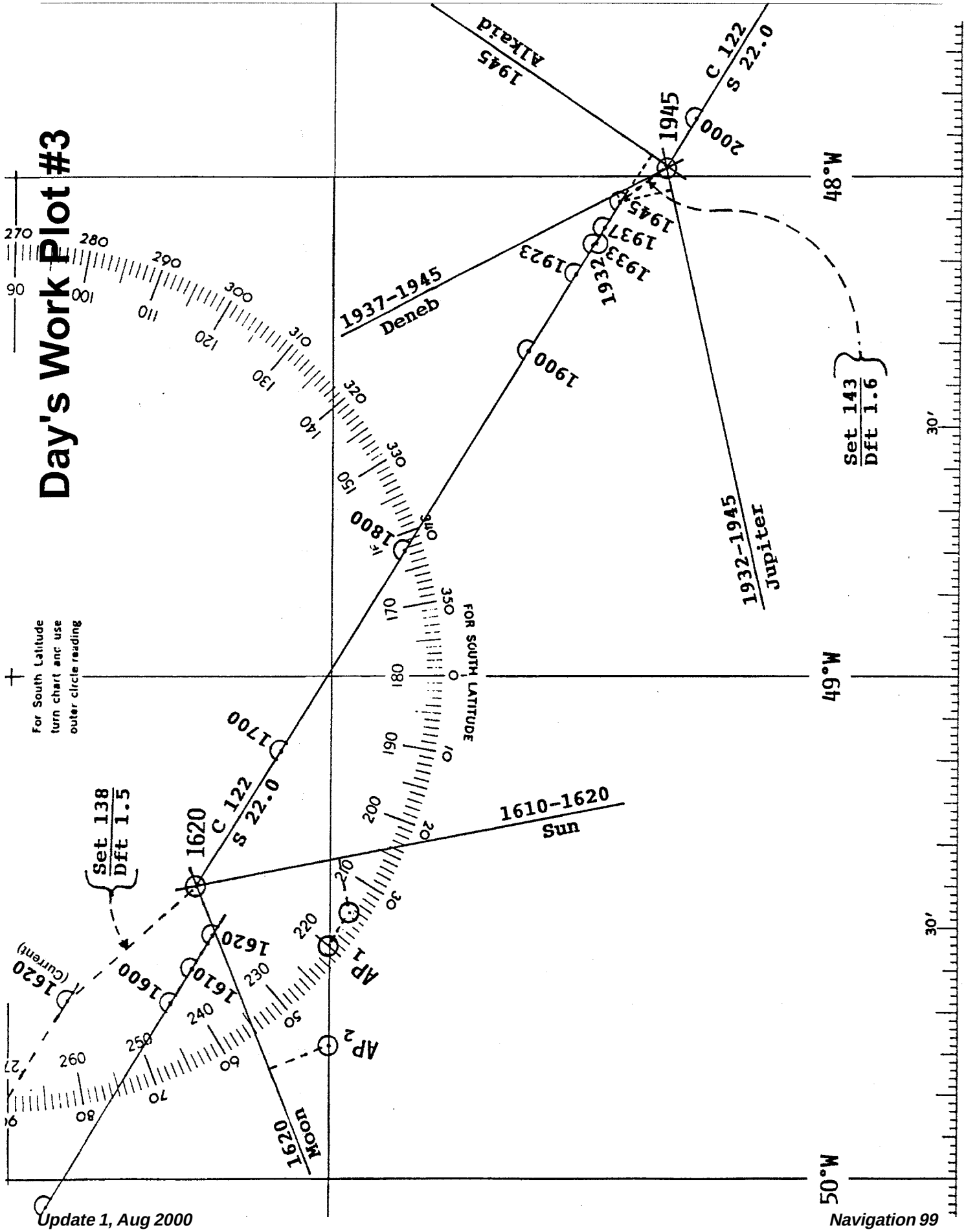
Change #	Section	Page	Column	Paragraph	Line	Change
☐ 24	OHT Masters	4		Sect 13	2	For transparency N9913–1b, delete *"(N9313–1b)"*

Updates are provided to keep the course material as current and correct as possible. The national course chairman welcomes all comments and suggestions. This Update includes submissions received by the Navigation Committee from interested Navigation instructors and students.

The Navigation Committee


Day's Work Plot #1
AP
Sun
0640
0700
0643
0640
0638
0600
0500
0420 GPS
0420
0400
0300
1400
1300
C 072
S 20.0
Set 129
Dft 1.6
C 122
S 22.0
53°W
54°W
55°W
Var 23°W
30'
41°
40°
FOR NORTH LATITUDE


Day's Work Plot # 2
41°
51°W
30′
40°
52°W
53°W
ZD +4
ZD +3
1300
1200
1155
1100
1000
0900
0830
0080
C 122
S 22.0
AP
1155 R Fix
Sun
0640-1155
1155
Sun
0900 (ZD +4)
(Sun on AM PV)
1000 DR (ZD +4)
(ZD +3)
0900 DR (ZD +4)
(ZD +3)
LATITUDE


Day's Work Plot #3
1945
Altair
C 122
S 22.0
2000
1945
1937
1933
1932
1923
1900
1937–1945
Deneb
1932–1945
Jupiter
Set 143
Dft 1.6
1800
1700
1620
C 122
S 22.0
Set 138
Dft 1.5
1610–1620
Sun
1620
1610
1600
1620
(Current)
AP1
AP2
1620
Moon
For South Latitude
turn chart and use
outer circle reading
FOR SOUTH LATITUDE
48°W
49°W
50°W
30'
30'

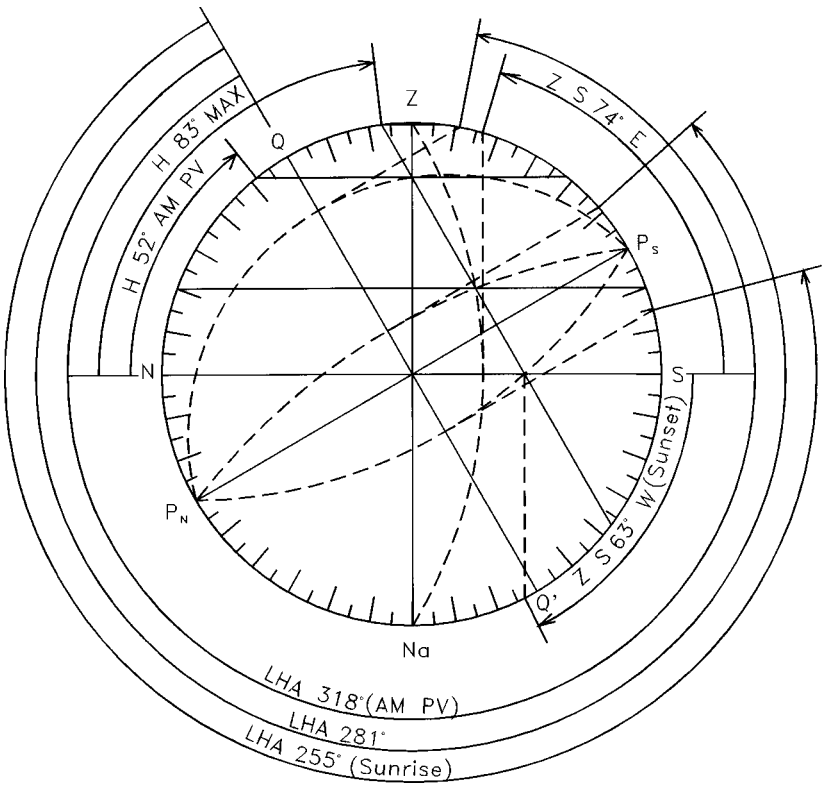
Solutions to Homework Problems

1. through 15. By definition - See Homework answers on page 15–1 of this manual.

16. A lifeboat is maintaining a compass course (CC) of 115°. At sunrise the relative bearing (RB) of the sun is taken as 338°; at sunset it is taken as 168°. What is the compass error (CE) for the boat's heading?

Compass Bearing (CB)	=	RB + CC
CB Sunrise	=	338° + 115° = 453° – 360° = 93°
CB Sunset	=	168° + 115 = 283°
CE	=	(CB @ SR + CB @ SS) ÷ 2 – 180°
	=	(93 + 283) ÷ 2 - 180°
	=	376° ÷2 = 188°; 188° – 180° = + 8° = 8° W

During the morning of 24 December, a sight on the lower limb of the sun was taken at sea with the following data: Lat 30°S, Dec 23°S, Ho 20°, UT 0120, and EqT is zero. Ignore any change in declination or EqT during the day. Using time and meridian diagrams as necessary, answer questions 17– 25. See the following diagram for graphic explanations of the answers.



17. Sun's LHA: 281°

18. Sun's azimuth angle: S 74° E

19. Sun's H on the AM PV: 52°

20. Sun's max. altitude: 83°

21. Sun's Zn on AM PV: 090°
    (By definition of PV)

22. Sun's LHA on AM PV: 318°

23. Sun's Zn at transit: 000°

    (See explanation below)

24. Sun's azimuth angle
    at sunset: S 63° W

25. Sun's LHA at Sunrise: 255°

Notes: Question 20 may also be solved by computation as follows:
z = L – Dec = 30° S – 23° S = 7°, H = 90° – z = 90° – 7° = 83°. In Question 23, at transit the sun is on the meridian and, unless it is straight overhead, Zn must be either 000° or 180°. By inspecting the diagram, you can see that when the sun is on the meridian, it is north of the observer and, therefore, the Zn is 000°.

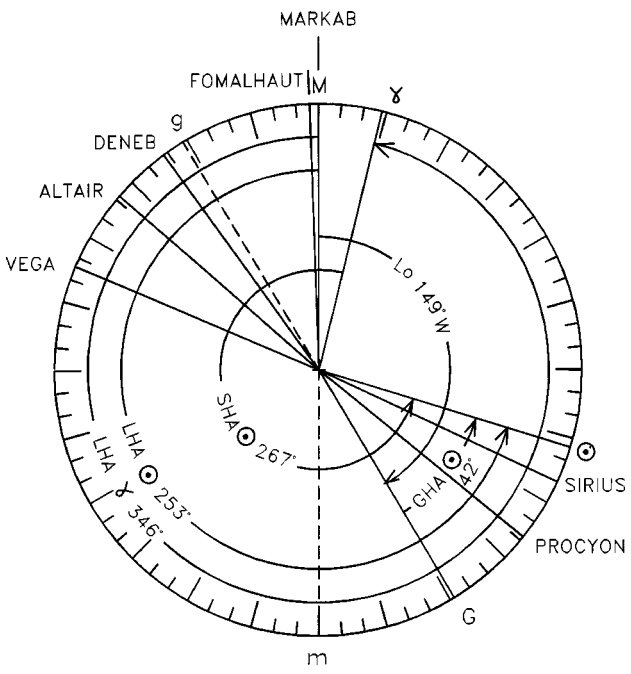
26. Compute the observer's Longitude.

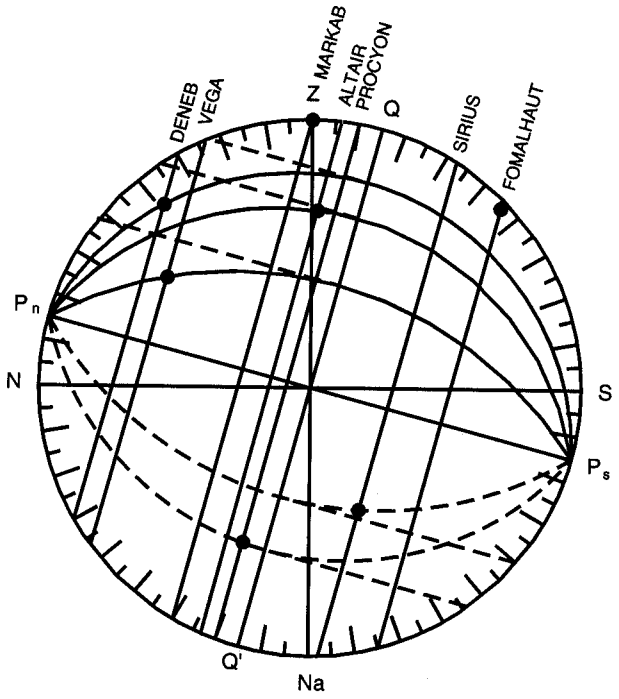
Lo W	= GHA sun – LHA sun. From question 17 LHA sun = 281°
GHA sun	= GAT ± 180° GAT = UT + EqT
EqT	= 0 (given), so GAT = UT = 0120
Converting time to arc, 0120	= 20° + 180° = 200° = GHA sun
GHA sun 200° – LHA sun 281°	= – 81° = 81° E

On a cloudless night you observe the star Markab directly overhead. UT is 1448 on 24 June. EqT is zero. The data shown below are for Markab and several other stars. The LHAs of the stars have been added to the data given in the original problem. (LHA star = LHA Aries + SHA star). Using the information given below, answer questions 27 through 35.

	SHA	Dec	Mag	LHA
Altair	63°	9°N	0.9	49°
Deneb	50°	45°N	1.3	36°
Fomalhaut	16°	30°S	1.3	2°
Markab	14°	15°N	2.6	0°
Procyon	245°	5°N	0.5	231°
Sirius	259°	17°S	–1.6	245°
Vega	81°	39°N	0.1	67°

The above data are displayed graphically as follows:





27. What is the observer's Latitude? Since Markab is directly overhead the observer's latitude is the same as Markab's declination.

15°N.