SKY DIAGRAMS

EXPLANATION

These diagrams show the appearance of the sky in various latitudes at different times of the day. They are useful in selecting the most suitable stars and planets for navigation on a given flight and for identifying prominent objects at the time of observation.

The *Sky Diagrams* have four advantages over ordinary star charts and star finders:

(a) They are ready for immediate use without settings or tables of any kind.
(b) Planets and the Moon are shown as well as the stars.
(c) True altitudes and bearings are shown on the diagrams without distortion.
(d) The appearance of the sky for different latitudes and times is shown at one opening so that the appearance for intermediate latitudes and times is easily visualised.

For each month there is a series of diagrams showing the sky for different latitudes at 2^h intervals during the day. The diagrams on pages A26–A61 are designed for use in latitudes S. 50° to N. 75°. Those for the morning hours appear on two facing pages, followed by those of the mid-day hours, and then by those for the evening hours. The diagrams for a given latitude are arranged in a row and show the changes in the sky during the day. The diagrams on pages A62–A73 are for use in the north polar regions; here all diagrams for a given month are on two facing pages. On each page is shown in the middle row of diagrams the appearance of the sky at the north pole, and in the other two rows the appearance at latitude N. 75° on opposite sides of the pole (that is, at longitudes differing by 180°) for the same instant of G.M.T. and hence for local times that differ by 12 hours. On the upper row of diagrams, these local times are printed with inverted figures. The navigator should select the diagram corresponding to his local time, and place the page with this time right side up at the bottom; north will then be at the top. In a flight which crosses the vicinity of the pole, the other row of diagrams shows the appearance of the sky to be expected after the other side of the pole has been reached. At the pole itself, the local time is indeterminate.

In each diagram the circular outline represents the horizon and the central cross the zenith. Altitudes are measured radially with a linear scale, i.e. an object one-third of the way from the edge to the centre has an altitude of 30°; the small circles on the diagrams are at altitudes 30° and 60°. Azimuths are measured as on the navigation chart with north at the top and east at the right. On various parts of the diagrams are small curved arrows indicating the diurnal motion in that area; the length of the arrows shows the motion in one hour.

The objects shown on the diagrams are the 57 selected navigational stars, the Sun, the Moon, the four planets Venus, Mars, Jupiter, and Saturn, and the north and south celestial poles. The position of a star or a planet is indicated by the symbol which also shows its brightness; the magnitude scale is shown on each of the odd numbered pages. Near each star symbol is the number in the list and near each planet symbol is its initial. The numbers of the 41 stars used in the *Sight Reduction Tables for Air Navigation* (H.O. 249, A.P. 3270) are shown in heavier type. The north and south poles are identified by the initials NP and SP. The position of the Sun is shown by a circle with a dot in the middle. The position of the Moon is shown by a circle with the day of the month on which it occupies that position.

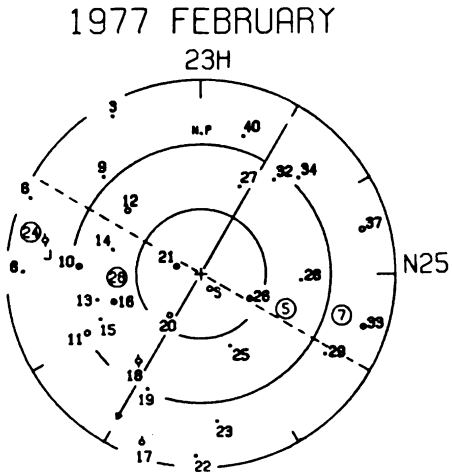
The positions of the stars and planets in each diagram are indicated for the 15th of the month and will usually serve for the entire month. If it is desired to allow for the motion of the stars during the month it is necessary only to remember that a given configuration will occur at the beginning of each month one hour later than the time indicated, and at the end of the month one hour earlier. In those months during which Venus moves considerably with respect to the stars the positions for the first and last of the month are shown; the position towards the west is for the first of the month.

As the Sun moves with respect to the stars, its position is given for the first and last days of the month relative to the position of the stars and does not represent the true altitude and azimuth at those times; the position towards the west is for the first of the month. To obtain the altitude and azimuth of the Sun at the beginning and end of the month, one must adjust the position of the Sun by the amount the stars would have moved. The lengths of the arrows indicate the motion of the stars in 15 days. When the Sun is above the horizon only the Moon and Venus can be seen with the naked eye, but the positions of the stars are given for use with astro-trackers.

The Moon moves so rapidly with respect to the stars that its position at a given time of the night varies appreciably from night to night, and it is necessary to show on each diagram a succession of positions for various days of the month. Three or more such positions are indicated and those for the intermediate dates may be estimated from those given. Since the Moon moves completely round the sky in slightly less than a month, or a little over 13° in a day, it will appear on a given diagram for about half of each month. The position on the diagram for each successive night is always to the eastward; when it disappears off the eastern edge of the diagram it will reappear on the western edge about two weeks later, except occasionally on the polar diagrams.

Example. Select the best available objects to give a fix at 23^h L.M.T. on 1977 February 10, during a flight on a true course/track of 210° in latitude N. 25°.

The required diagram is reproduced here from the *Air Almanac* 1977 January–June, with the course/track of 210° marked on it.



Examination of the diagram shows immediately that the best objects, giving position lines perpendicular to the track and parallel to it are **18** and **12**, *Sirius* and *Capella*. *Sirius* is in altitude about 40°, true bearing about 210°; *Capella* is in altitude about 45°, true bearing about 300°. If desired the altitudes and bearings may be found more accurately with dividers and the scale diagrams.

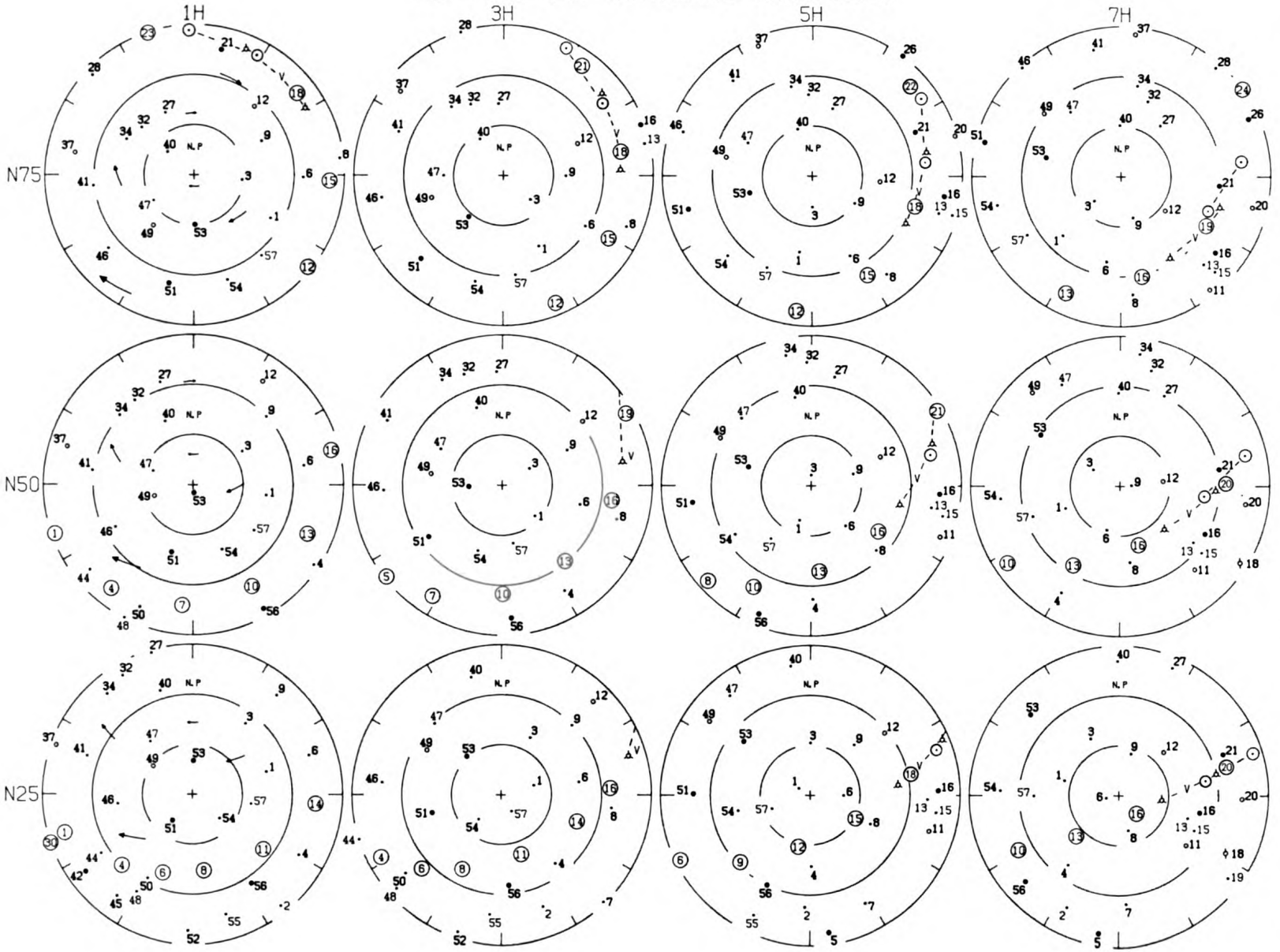
The *Sky Diagrams* used in conjunction with the star chart and the planet location diagram on page A75 are extremely effective in star identification, the star chart and the planet location diagram being used for detailed verification of the identification made with the *Sky Diagrams*.

Example. On 1977 March 1^d 22^h L.M.T. in latitude N. 25°, it is desired to know what objects are visible. The diagrams are for the fifteenth of the month, but the same configurations occur on the first of the month, *one hour later*, or on the first of the following month, *one hour earlier;* therefore, the above diagram for February 15^d 23^h can be used for March 1^d 22^h. The azimuths and altitudes of the various objects visible at that time can now be read from the diagram.

It must be remembered that the *Sky Diagrams* are to be used flat on the chart table and that they show bearings as they appear on the navigator's chart, east to the right. The star chart and the planet location diagram, on the other hand, are designed to be held overhead for comparison with the sky, and on them east is to the left.

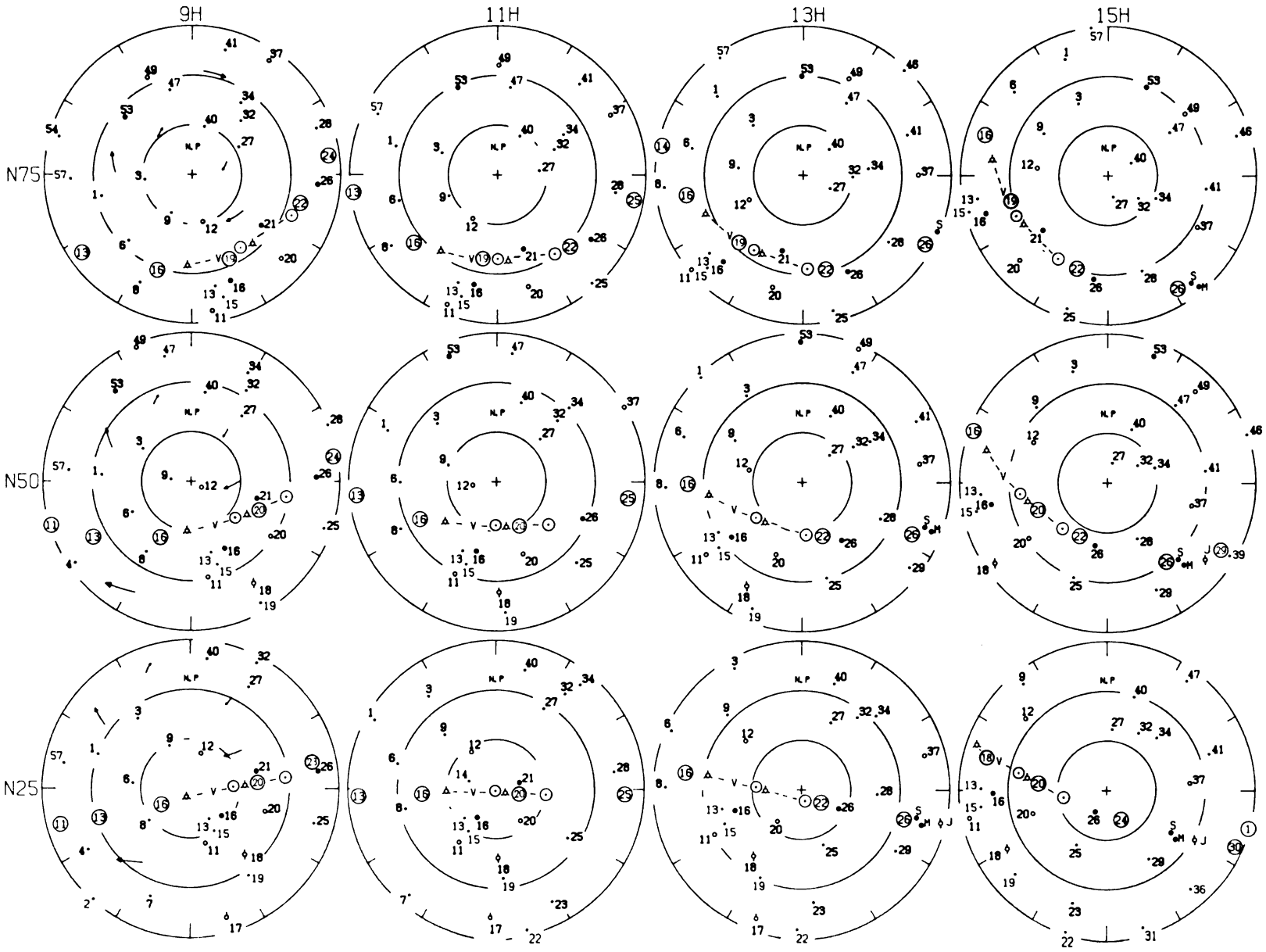
For some intermediate latitude, such as 40°, or for an intermediate time, such as 22^h, altitudes and bearings may be taken from two diagrams and a more accurate result obtained by interpolation; but such refinements are not usually necessary.

MORNING SKY DIAGRAMS 1982 JULY



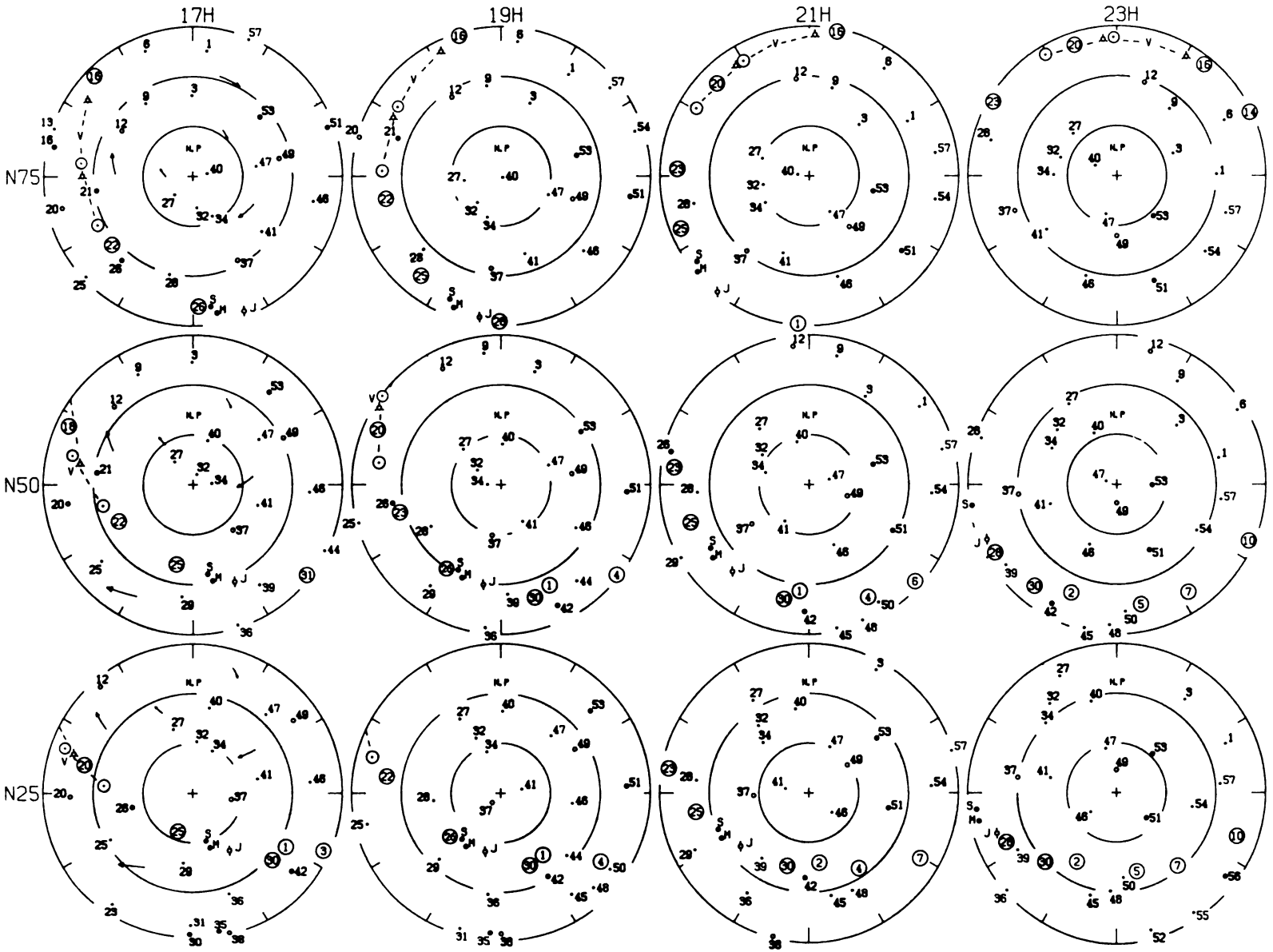
STARS	
No.	S-4 Mag.
1	1.8
2	3.9
3	4.1
4	3.6
5	0.1
6	3.8
7	3.2
8	5.3
9	2.4
10	3.1
11	0.0
12	1.3
13	1.2
14	1.4
15	1.3
16	2.5 to 3.6
17	−0.8
18	−1.5
19	1.2
20	0.8
21	2.5
22	3.3
23	4.6
24	1.8
25	4.4
26	1.0
27	3.4
28	2.2
29	2.5
30	0.5
31	4.1
32	1.5
33	0.7
34	1.5
35	0.3
36	3.5
37	1.9
38	0.9
39	3.2
40	4.3
41	2.1
42	3.7
43	4.1
44	2.5
45	1.3
46	2.2
47	4.6
48	2.0
49	0.0
50	1.9
51	1.0
52	1.7
53	1.4
54	4.8
55	1.8
56	1.3
57	2.3
Polaris	3.2

DAY SKY DIAGRAMS 1982 JULY



STARS	
No.	S-4 Mag.
1	1.8
2	3.9
3	4.1
4	3.6
5	0.1
6	3.8
7	3.2
8	5.3
9	2.4
10	3.1
11	0.0
12	1.3
13	1.2
14	1.4
15	1.3
16	2.5 to 3.6
17	−0.8
18	−1.5
19	1.2
20	0.8
21	2.5
22	3.3
23	4.6
24	1.8
25	4.4
26	1.0
27	3.4
28	2.2
29	2.5
30	0.5
31	4.1
32	1.5
33	0.7
34	1.5
35	0.3
36	3.5
37	1.9
38	0.9
39	3.2
40	4.3
41	2.1
42	3.7
43	4.1
44	2.5
45	1.3
46	2.2
47	4.6
48	2.0
49	0.0
50	1.9
51	1.0
52	1.7
53	1.4
54	4.8
55	1.8
56	1.3
57	2.3
Polaris	3.2

EVENING SKY DIAGRAMS 1982 JULY



STARS	
No.	S-4 Mag.
1	1.8
2	3.9
3	4.1
4	3.6
5	0.1
6	3.8
7	3.2
8	5.3
9	2.4
10	3.1
11	0.0
12	1.3
13	1.2
14	1.4
15	1.3
16	2.5 to 3.6
17	−0.8
18	−1.5
19	1.2
20	0.8
21	2.5
22	3.3
23	4.6
24	1.8
25	4.4
26	1.0
27	3.4
28	2.2
29	2.5
30	0.5
31	4.1
32	1.5
33	0.7
34	1.5
35	0.3
36	3.5
37	1.9
38	0.9
39	3.2
40	4.3
41	2.1
42	3.7
43	4.1
44	2.5
45	1.3
46	2.2
47	4.6
48	2.0
49	0.0
50	1.9
51	1.0
52	1.7
53	1.4
54	4.8
55	1.8
56	1.3
57	2.3
Polaris	3.2