THE AMERICAN AIR ALMANAC

In 1933 the U.S. Naval Observatory prepared and published an air almanac planned especially for the aviator. This almanac, designed to eliminate many steps previously required for solving celestial sights, was enthusiastically received by airmen and led to the issuance of air almanacs by several foreign governments. Lack of sufficient appropriations prevented the Naval Observatory from continuing the publication of the American Air Almanac.

However, coincident with the increased acceleration of aviation activities, funds were recently made available to resume publication of the Air Almanac. This publication will appear in issues covering periods of four months, the first issue being for the months of January, February, March, and April, 1941. It is expected that this issue will be available for sale early in December, 1940, through the Superintendent of Documents, Washington, D. C.

All data for one day are concentrated on a single sheet. These include coordinates of the Sun, Moon, principal planets, and stars, as well as sunrise, sunset, moonrise, and moonset tables. Interpolation tables are placed adjacent to this daily sheet and so arranged as to be easily understood. Every effort has been made to shorten the number of operations required in working sights of heavenly bodies, an obvious saving of time as well as decreasing the chances for error in computation.

At the time when the Aircraft Navigational Manual, H. O. Publication N° 216 was prepared, the manuscript of the American Air Almanac was not available for use in illustrating the chapter on Celestial Navigation. The values contained in the American Air Almanac, however, may readily be substituted for those taken from the American Nautical Almanac and used with even greater facility.

EXPLANATION.

1. The object of this volume is to provide in convenient form the astronomical data required for aerial navigation. The two sides of a single leaf give complete data for a single day. Auxiliary tables are given inside the front and back covers, on the flap near the back, and on the outside back cover; these tables give values to the nearest minute without interpolation.

2. Columns 2-7 of the daily sheets give the Greenwich Hour Angles at ten-minute intervals for the Sun, Vernal Equinox, the three planets most suitable for observation at that time, and the Moon, and declinations at ten-minute intervals for the Moon and at hourly intervals for the Sun and planets. The magnitudes and symbols of the planets are given in the headings with their names.

3. The GHA of a star is found by adding the Greenwich Hour Angle of the Vernal Equinox to the star's Sidereal Hour Angle, i. e.

$$GHA* = GHA\ \gamma + SHA*$$

On the inside of the back cover are given the Name, Mag., SHA, Dec., and RA of each of the 55 principal navigational stars. Two separate lists are given: one in alphabetical order, and the other in order of SHA.

4. The semidiameters of the Sun and Moon and the correction for Moon's parallax are given on the A. M. side of the daily sheets. Two correction tables are given on the outside of the back cover, one for refraction and one for dip. The correction for refraction, which must be applied to all observed altitudes, depends on the height of the observer in feet and on the observed altitude. The correction for dip, which must be applied to altitudes measured from the sea horizon, depends on the height of the observer.

5. The narrow diagram on the A. M. side of the daily sheet shows the region along the ecliptic circle within which the Sun, Moon and Planets are always found. The four bright stars Aldebaran (*a*), Regulus (*b*), Spica (*c*) and Antares (*d*) are also near the Ecliptic and are shown in the diagram. The Moon is shown in its proper phase. The five planets, Mercury, Venus, Mars, Jupiter, and Saturn, are included except when they are within 5° of the Sun.

6. The Polaris table found on the back of the flap gives for various values of the Local Hour Angle (LHA) of the Vernal Equinox the correction which must be applied to an observed altitude of Polaris to determine the latitude.

7. Tables for finding the times of Sunrise, Sunset, beginning and ending of Civil Twilight, Moonrise and Moonset for latitudes between 60° S and 60° N are given on the P. M. side of the daily sheets. The columns under Sunrise and Sunset give the local civil times of these phenomena. The columns under Twilight (Twlt.) give the duration of Civil Twilight. It is assumed that morning Civil Twilight begins when the Sun is 6° below the horizon and ends at Sunrise and that evening Civil Twilight begins at Sunset and ends when the Sun is 6° below the horizon. The time of beginning of morning Civil Twilight is obtained by subtracting the duration of Twilight from the time of Sunrise; the ending of evening Twilight is obtained by adding the duration of Twilight to the time of Sunset.

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10. The columns under Moonrise and Moonset give the Local Civil Time of these phenomena for the meridian of Greenwich. Since the times of Moonrise and Moonset are considerably later on succeeding days, it is necessary to interpolate for the longitude of the observer; the last column (Diff.) is provided for this purpose.

11. The times of Moonrise and Moonset as given on the daily sheets are sometimes greater than 24 h. This means that the phenomenon really occurs on the following day but the time is given in this form to facilitate the interpolation for longitude. For any given meridian the time of Moonrise or Moonset is about an hour later (on the average) each succeeding day. If then, on a given day, one of these phenomena occurs near midnight, the next one will occur about 25 hours later which carries it over into the second day.

13. The tables, Interpolation of GHA, Dip, Polaris, 's Par. and Corr. HA , are the socalled "critical" or "turning point" type; i.e., the values of the argument given are those for which the function changes from one unit to the next. The value of the function is therefore found to the nearest unit without interpolation. If the required value of the argument is one of the printed values of the table, the upper of the two adjacent values of the function should be taken.