Star Transit Times

Figure 1-3 in the Field Guide is a Graphic Timetable of the heavens giving the transit times of the bright stars. Use it to find the following[10]

Date	Star	Transit Time
September 1	Deneb	11 pm EDT
April 1	Vega	
May 1	Vega	
June 1	Vega	
July 1	Vega	
August 1	Vega	
September 1	Vega	
May 15		5 am EDT
	Betelgeuse	7 am EDT
February 1		8 pm EST
March 1	Aldebaran	

What pattern do you see in the transit times of Vega through the spring and summer? [3]

Assuming a month is 30 days, how many minutes earlier does Vega transit each day?[3]

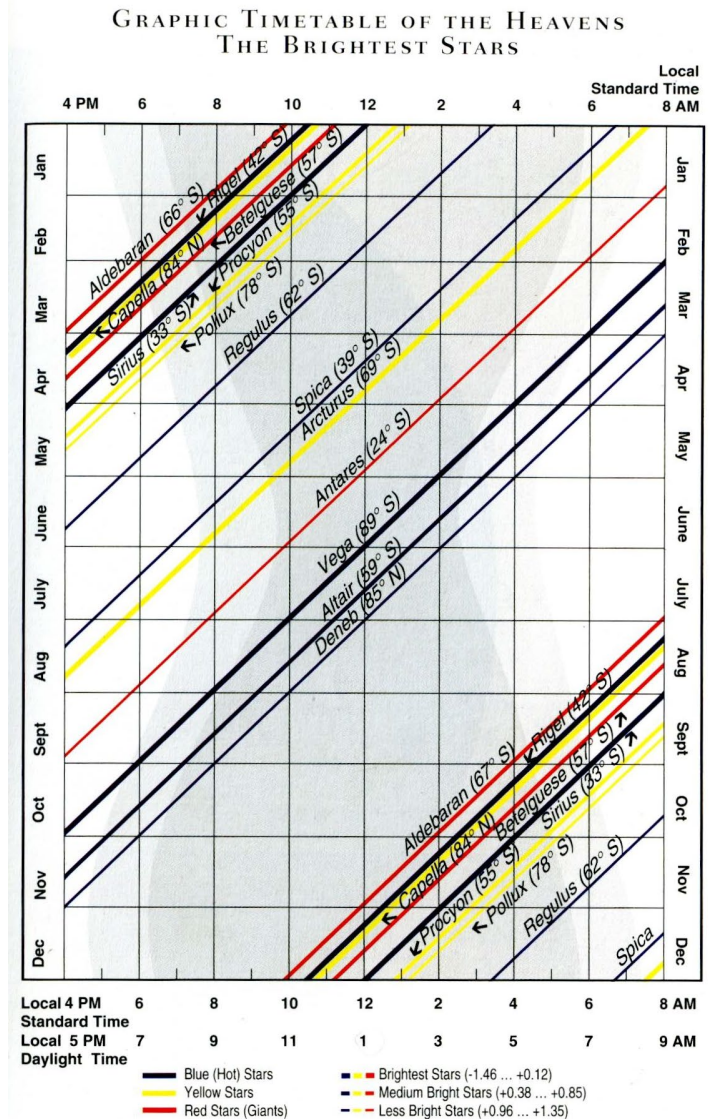GRAPHIC TIMETABLE OF THE HEAVENS
THE BRIGHTEST STARS

Fig. 1-3 Graphic Timetable of the Brightest Stars, showing when they transit. (© 2000 Scientia, Inc.)

The Speed of Noon at the Equator

Noon was defined as the transit time of Sun. As the Earth spins "beneath" the sun, the sun is directly over different points on Earth through the day. Thus "noon" travels around the Earth at some speed. It travels all the way around the Earth in one day. On the equinoxes it travels along the equator where Earth's radius is 6.4×10^6 m, so calculate the speed of noon:[4]

These are for you to see the logic   Calculate this!

$$V_{noon\ at\ equator} = \frac{distance}{time} = \frac{2\pi R_{equator}}{24\ hours} = \frac{2\pi(6.4\times10^6\ m)}{24(60)(60)sec} = \underline{\hspace{2cm}} \frac{m}{s}$$

or, taking $1\frac{m}{s} = 2.24\ mph$, the speed of noon along the equator is $V_{noon\ at\ equator} = \underline{\hspace{2cm}}$ mph

B. Terminator Speed in Canton

The terminator is the edge of the Earth's shadow on itself, that is, the edge of night or sunset and sunrise. Sunrise and sunset occur when the terminator passes your position on Earth. Since we don't stand at the equator, the distance traveled by the terminator that passes over SLU is smaller than the distance traveled by the terminator at the equator. The rotational radius (the radius from the axis of rotation) of the Earth at Canton is $R_{equator}$ X $\cos(44.6°)$ since Canton is at a latitude of 44.6°. Hence the velocity of the terminator (or noon) at Canton is less than that at the equator. Calculate the speed of the terminator at Canton: [4]

This is for you to see the logic   Calculate this!

$$V_{noon\ in\ Canton} = \frac{2\pi\left[R_{equator}\cos(44.6°)\right]}{24\ hr} = \frac{2\pi\left[(6.4\times10^6 m)\cos(44.6°)\right]}{24(60)(60)sec} = \underline{\hspace{2cm}} \frac{m}{s}$$

$V_{noon\ in\ Canton} = \underline{\hspace{2cm}}$ mph

Unit Conversion from m/s to mph

MUTTS   BY PATRICK McDONNELL