The Sundial At All Saints' Church

The Sundial was commissioned in 2012 to mark the 60th anniversary of the Accession of Queen Elizabeth II and the 50th anniversary of the Stamford Civic Society

How To Tell The Time Of Day Using This Sundial

The face of the sundial is marked by hour lines radiating from the semicircle at the top of the dial. Intermediate quarter hours are marked by short lines in the border. The hour lines start at 5am (V in Roman numerals) at the top left, progressing anticlockwise to 4pm (IIII in Roman numerals) at the top right.

The *Gnomon* is a blade of metal set at a precisely calculated angle to the face of the sundial, marked as **G** on the illustration. Whenever the sun shines on the dial the gnomon casts a shadow **S** and one edge of the gnomon's shadow falls on or between radiating hour lines. In the case illustrated, the upper edge of the shadow is falling between the 1 o'clock and 2 o'clock hour lines, on the third intermediate quarter hour line. The time is 1 hour 45 minutes pm.

This is termed the *Local Apparent Time*. (LAT). It is Local because it is measured with reference to the Stamford meridian - more precisely the line of longitude which passes through the sundial. Unless two towns happen to lie on the same meridian their local apparent times will be different. Although correct, this was rather inconvenient – particularly with the coming of the railways and the need to publish timetables.

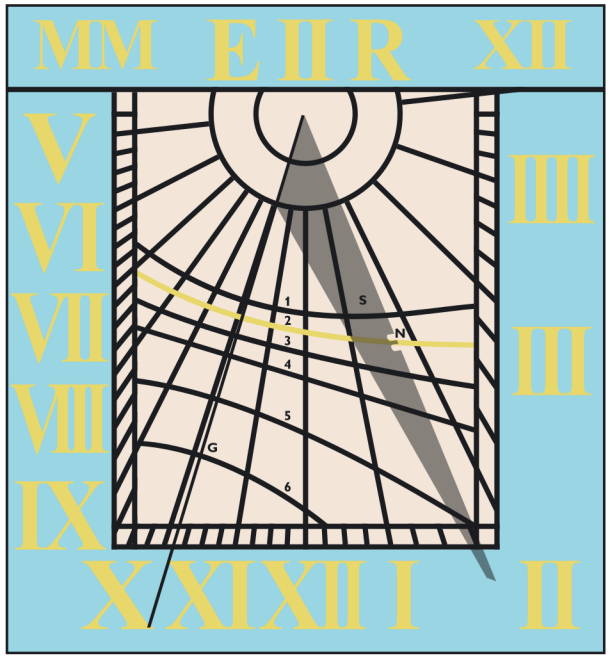
Sailors had long used time measured by reference to the Greenwich meridian. In 1880 it became a legal requirement for all land based clocks in the United Kingdom to do the same. Stamford is 0.4837 degrees west of the Greenwich meridian. In 24 hours the earth rotates through 360 degrees so Stamford time is earlier than Greenwich Time by 1.93 minutes (1 minute 56 seconds) and always will be. So when the sundial in Stamford reads 1 hour 45 minutes, a sundial in Greenwhich will read 1 hour 46 minutes and 56 seconds.

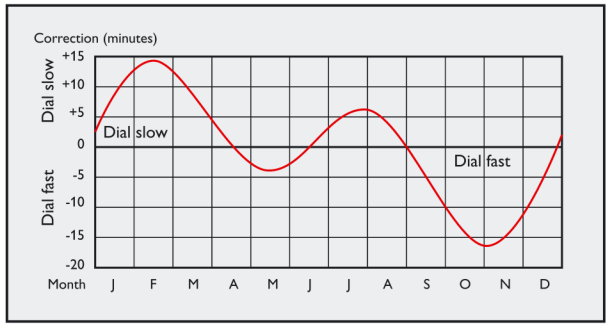
A further adjustment is needed. The earth's orbit around the sun is not circular, it is very slightly elliptical and it is tilted with respect to the earth's equatorial plane. These two effects mean that the days in the year are not of equal length; on only four occasions each year are the days exactly 24 hours long. Although the sundial measures the variable-length days accurately it would be difficult and expensive to create a clock or watch that does the same. So our clocks and watches use the average day length over the full year – creating much more convenient *Mean* time. Compared to Mean clock time, sundial time appears to be running slow by about 14 minutes in mid February but running fast by 16 minutes at the end of October.

The so-called "Equation of Time" lets us convert our sundial time to Mean time. Find the current date on the curved line on the adjacent chart and read off the minutes fast or slow. Our illustrative example has a date of 6th February (explained below) and the curve shows the sundial is running slow by 14 minutes and 4 seconds.

Adding those 14 minutes and 4 seconds converts our sundial to Greenwich Mean Time (GMT) of 2 hours 1 minute and 00 seconds pm.

When British Summer Time is in operation, add one hour to GMT.





How To Tell The Day Of The Year Using This Sundial

It is widely known that a sundial measures the time of day. It is less well-known that it can also measure the date. It does this by means of *Declination Curves*.

The gnomon has a notch in the upper edge. This is the nodus which shows as a notch (**N**) in the shadow. Every day the shadow of the nodus traces a path across the face of the dial. These daily paths are called declination curves.

Declination curves have been marked on this sundial. In principle the designer can mark as few or as many as they like. In this case the designer has chosen to mark the following six dates:

1. The winter solstice (the shortest day)	21st December
2. Accession Day of HM The Queen	6th February
3. Foundation Day of Stamford Civic Society	12th October
4. The equinoxes, when day and night are of equal length	23rd September & 20th March
5. St George's Day	23rd April
6. The summer solstice (the longest day)	21st June

Looking at the illustration, we can see that the shadow of the nodus notch is tracking the declination curve for 6th February. So the illustration tells us that it is 2 hours 1 minute and 00 seconds GMT in the afternoon of 6th of February.

The Making and Installation of the Sundial: Cliveden Conservation Workshop Limited

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heritage lottery fund
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