

## **THANK YOU FOR PURCHASING THIS TIDE CLOCK**

An 'AA' size battery is required for operation. Insert into the holder on the rear of the movement

A high quality battery will last longer and is also much less likely to leak corrosive fluid.

Never leave a discharged battery in the clock.

Properly cared for this clock should provide years of service

### **SETTING YOUR CLOCK**

Conventional time clocks have a 12 hour cycle. Tide clocks have a cycle of 12 hours 25 minutes, coinciding to an average time of about 6 hours 12 minutes between high and low tides.

For the reasons outlined in more detail below, and to attain the best accuracy, it is recommended to first set the clock on a day when your local high tide coincides with a full Moon.

Obtain a local tide table and calendar showing phases of the Moon from the Links page of our website, [www.cruisingelectronics.co.nz](http://www.cruisingelectronics.co.nz) or your local newspaper, a Nautical Almanac or similar.

On the day of a full Moon, use the small adjusting wheel on the rear of the clock movement to adjust the clock hand to the high tide position at your exact local time of high tide.

Set in this way, the clock will exhibit a minimum error throughout the month, usually less than 30 minutes. Please read below for a more detailed description of the tides and their influences.

#### **A brief explanation of how the Tidal cycle works**

The Moon is the major cause of the tides. The 'lunar day' (the time it takes for the Moon to re-appear at the same place in the sky) is 24 hours and 50 minutes.

New Zealand, and most places in the world, have 2 high tides and 2 low tides each day.

Some areas of the world (eg Freemantle in Australia), have only one tide cycle per day, and a Tide Clock such as this unit is not suitable for those areas.

Our website, [www.cruisingelectronics.co.nz](http://www.cruisingelectronics.co.nz) has site Links with detailed world tidal information.

The Tide Clock hand rotates once every 12 hours and 25 minutes (twice each lunar day).

This equals 1/2 the average period of the Moon orbit around Earth, but there are many other factors that can make the day-to-day tides a little earlier or later than the Tide Clock shows.

Each user must determine these conditions for his own locality and to take them into account.

The Sun also affects the tides, but has less than half the influence of the moon. When Sun, Moon and Earth are lined up, as they are at times of new Moon and half Moon, their influence combines and high tide is higher than normal and low tide is lower than normal. When the Sun and the Moon are at right angles, as they are at the first quarter and last quarter of the Moon, the Sun cancels some of the Moon's effect, and the range of tide is smaller than normal. Also, at these times the Sun will make the tides somewhat earlier or later than average. This is why it is so important to first set your Tide Clock on the day of a full Moon, as the Moon has the dominating effect on the tides.

#### **Other Information**

There are actually 2 tidal cycles - a twice-daily cycle and a once-daily cycle. On a tide when the 2 cycles help each other, high tides will be higher and low tides lower. On the next tide, when they conflict, the tidal range will be smaller. The relative strength of these 2 cycles varies from week to week and also varies from one place to another.

Abnormal atmospheric pressure can temporarily affect the time and height of tides.

A difference of 30 mB (1 inch) in barometric pressure will cause about 300mm (1 foot) difference in sea level. Strong onshore winds will also cause a temporary increase in sea level. Both of these effects will change the times of low and high tides as well.

Tides in the lower portions of rivers will be affected by the changing volume of the river flow.

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