FACTSHEET – OUR RECONSTRUCTION OF THE ANTIKYTHERA MECHANISM

Our reconstruction of the Antikythera Mechanism is a working instrument which includes all of the gear chains and dials incorporated by the ancient Greek astronomers into the original. It works as the original designers intended; allowing you predict eclipses and locate planets in the night sky, predicting when they will be at their brightest, when they will go into retrograde motion and when one or more of them will come together in conjunction.

Although the Mechanism was designed over 2,000 years ago, it follows many design principles we would recognise today. In modern terms we could view the Mechanism as 5 independent groups of functionality or "modules", which are connected together by gears and driven from a single manual input.

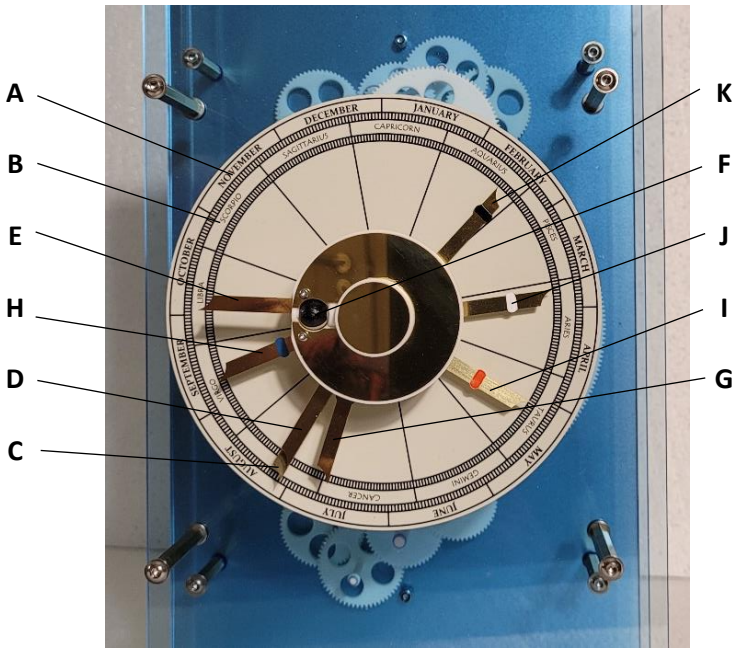
In the **"Calendar Computer"** at the back of the instrument we have:

1. **The Date Converter gear train** which includes the Metonic Dial gear train to drive the Metonic calendar date, the Gregorian calendar date and the lunar position hand on the front dial.
2. **The Eclipse Prediction gear train** which drives the pointer on the Saros dial on the back face.
3. **The Lunar Anomaly gears** which includes epicyclic gearing to adjust the position of the Moon to account for the First Lunar Anomaly.

Then the gears for the **Orrery** at the front include:

4. **The Inferior Planet gears** which include 3 sets of epicyclic gearing to drive the hands on the front dial. These indicate the position of the Inferior Planets and the Sun, after adjustment for the ellipticity of their orbits.
5. **The Superior Planet gears**, including another 3 sets of epicyclic gears which work in a different way to drive the hands on the front dial to indicate the position of the Superior Planets, after similar adjustment.

THE FRONT DIAL



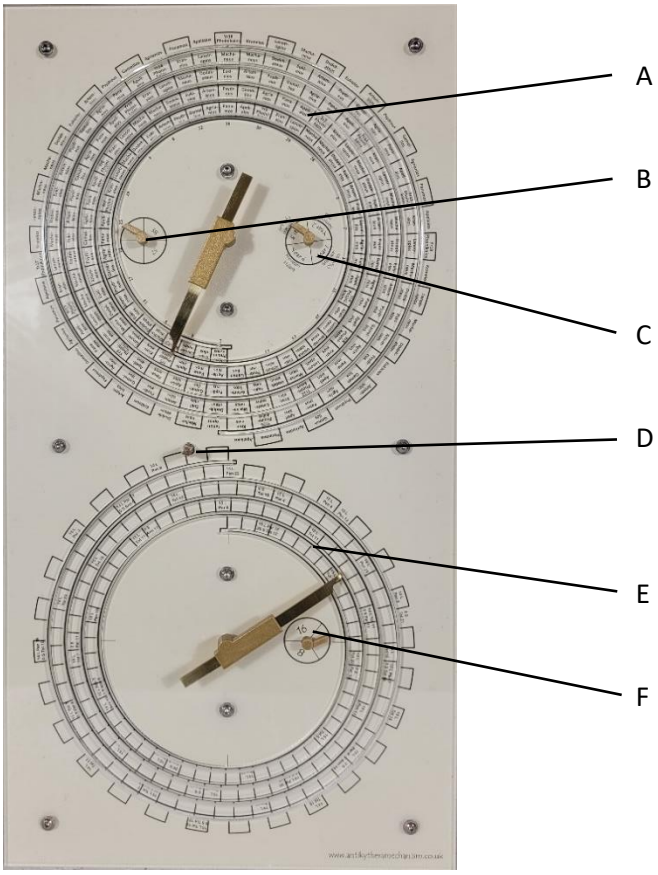
There are two scales on the Dial. The outer scale is calibrated in days; the inner scale is calibrated in degrees.

A. Outer scale	Shows the Gregorian calendar. The year is divided into 365.25 days with the quarter day shown at the end of February.
B. Inner scale	This scale is divided into the 12 signs of the 20th century astrological (rather than astronomical) zodiac. These are derived from the Babylonian original. Each sign occupies 30 degrees and corresponds to the approximate position of its constellation in the night sky.
C. Date Pointer	Indicates the Gregorian calendar date against the outer scale on the front dial.

D. "True Sun" Pointer	Indicates the true position of the Sun in the Zodiac, as measured against the inner scale. This position takes into account the slightly elliptical orbit of the Earth.
E. Lunar pointer	Gives the position of the Moon in the Zodiac on the date set. The pointer makes one full turn through the Zodiac in a lunar sidereal month of 27.32 days.
F. Moon ball	Indicates the phase of the Moon on the set date. The white side of the ball always faces towards the True Sun. The ball makes one full turn in a lunar synodic month of 29.53 days.
G. Mercury pointer (dark grey)	Indicates the position of Mercury, the star of Hermes, on the set date. Since the orbit of Mercury lies inside the Earth's orbit around the Sun, the planet appears to "flit" from one side of the Sun to the other and then back again in only 88 days.
H. Venus pointer (blue)	Gives the position of Venus, the star of Aphrodite, in the Zodiac on the set date. As an inner planet, Venus exhibits the same behaviour as Mercury although it moves more slowly, orbiting the Sun in 225 days. Venus can be seen as a very bright star, especially when in opposition.
I. Mars pointer (red)	Indicates the position of Mars, the star of Ares, the god of war. This is the first planet whose orbit lies outside the Earth's, so it can "go behind" us. Mars orbits the Sun in 687 days.
J. Jupiter pointer (white)	Indicates the position of Jupiter, the star of Zeus, King of the Olympian gods and the son of Chronos. Jupiter is much further out, so it orbits more slowly, taking 4,333 days to orbit the Sun.
K. Saturn pointer (black)	Indicates the position of Saturn, the star of Chronos, the god of time. Saturn takes 10,759 days to orbit the Sun, i.e. almost exactly 29.5 years, so it acts as a year indicator. The position of Saturn during opposition indicates the calendar year, hence the term "chronology".

PLEASE NOTE: The Mechanism generally indicates the position of a planet to within 5 degrees over long periods, although there are certain exceptions. These are explained in the User Guide and in the FAQ section of our website.

THE BACK DIALS



All of the dials on the *back* face of the Mechanism are calibrated in lunar (synodic) months apart from the Games dial which is calibrated in years.

A. Metonic spiral	Shows the 30-day lunar month according to the Metonic/Callippic calendar used by the Greek astronomers. The month names are believed to be those used in Epirus in the north-west of the Greek mainland but expressed here in our Latin alphabet. There are 5 turns of the spiral with years numbered 1 to 19. The dial includes additional intercalary months (Machaneus) in certain years and, on the inner scale, intercalary days to be skipped in certain months.
B. Callippic dial	Indicates whether the date is in the first, second, third or fourth Metonic cycle within the Callippic cycle of 76 years; and the corresponding number of years to be added to the year number in the Metonic dial. One day is skipped from the last day of the fourth cycle to keep the Callippic cycle precisely at four times 6939.75 days.
C. Games dial	Indicates which athletic games would be held in Greece if the games cycles in each city had been maintained from antiquity. Six games are shown which were held in 2 and 4 year cycles. Four of the games were known as the Panhellenic games, of which the most important was the Olympics, which were held in Olympia every 4 years. The other games indicated are the Pythian games which were held in Delphi, the Nemean games held in Corinth and the Isthmian games held near the Gulf of Corinth. The Games dial also includes two lesser known games; the Naa games held in Epirus and the Halieia games held in Rhodes.
D. Key	The key can be turned clockwise or anti-clockwise. Turning the key clockwise advances the date on all dials. Turning it anti-clockwise moves the date back in time.
E. Saros spiral	Shows the Saros cycle of 223 lunar months within which a pattern of lunar and solar eclipses repeats. There are 4 turns in the spiral, in which each cell corresponds to a lunar month on the Metonic dial. In certain cells there is text indicating that an eclipse will occur. The first letter indicates L for a lunar eclipse or S for a solar eclipse. The next letters indicate the type of eclipse predicted, either total ("Tot"), annular ("Ann"), partial ("Par") or penumbral ("Pen"). The day within the lunar month and the time of the maximum eclipse, in UTC time, are then given. To this time should be added the number of hours indicated in the Exeligmos dial. For example, in the 9th cell (counting clockwise from the inner start point of the spiral) the text indicates that a total lunar eclipse will occur on the 15th day of the lunar month at 14:00 hours UTC. Instructions for how to convert dates and predict eclipses are given later in this guide. The predictions include those which should be visible in Europe, but the visibility will depend on the latitude of the observer and, of course, the weather conditions prevailing at the time.
F. Exeligmos dial	Shows how many hours should be added to the timing of the eclipses in the Saros dial, either 0, 8 or 16. The Exeligmos is a sequence of 3 Saros cycles which takes into account that a Saros, being 6,585 days and 8 hours, is not an exact number of days long. Hence the Exeligmos pointer makes one full turn in 3 Saros cycles.

DIMENSIONS

The instrument measures 20cm wide; 38cm high and 12.5cm deep.