

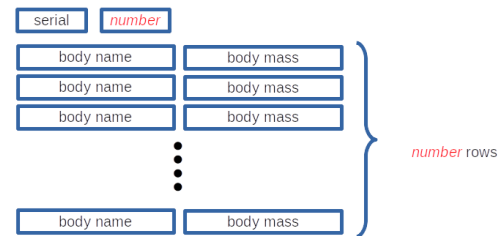
# The structure description of the ephemeris binary file, serial number 1379, based on the StePPeD database release 3.2.

(the latest version of this document can be found at: <https://pad2.astro.amu.edu.pl/StePPeD> in available downloads)

## 1. The header (see Fig.1)

A) Two integer numbers: ephemeris **serial** number (version) and the total **number** of bodies (the Sun plus stars) [total size is 4+4 bytes]

B) A table with the bodies names and masses. In each row we have 8 characters of the body name (including a terminating null byte ‘\0’) and a double number containing the mass of the body. [total size is **number** \* (8+8) bytes]



**There are 92 bodies in the backward ephemeris and 67 bodies in the forward one.**

Figure 1: Header structure

## 2. The set of the step data, see Fig.2. Each step data block consists of two parts:

A) Two double numbers containing start and end epochs of the particular step [total size 8+8 bytes]

B) The set of **number** blocks of data, each containing all coefficients for one body (see Fig.3). Each body block contains 30 double numbers (10 for each component) [total size **number** \* 240 bytes]

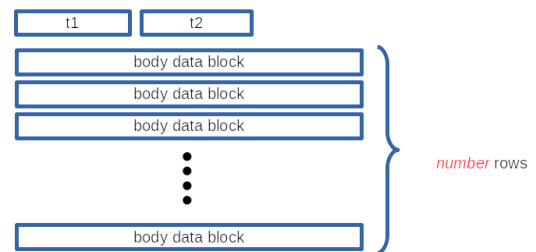


Figure 2: one step data block

The total size one step block of data equals 16 + **number** \* 240 bytes.

**There are 1268 steps in the backward ephemeris and 1266 in the forward one.**

```
typedef struct {
    double x,          // x component of the position
           vx,         // x component of the velocity
           ax,         // x component of the acceleration
           bx[7],      // polynomial coefficients for the x component
           y,          // y component of the position
           vy,         // y component of the velocity
           ay,         // y component of the acceleration
           by[7],      // polynomial coefficients for the y component
           z,          // z component of the position
           vz,         // z component of the velocity
           az,         // z component of the acceleration
           bz[7];      // polynomial coefficients for the z component
} STAR;
// the size of this structure equals: 3 * 10 * 8 = 240 bytes
```

Figure 3: The body data block structure - an excerpt from the ephemeris reading code.