Sample Formatting for Tracking Eastern Box Turtles

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Introduction

The following is a breakdown of the file format created to store the samples of Eastern Box Turtle data in Schenck Forest, Raleigh. The data is stored in a plain text file, with the only content being sampled data, separated by newline characters. This file feeds into a computer program to translate into an intelligible CSV file.

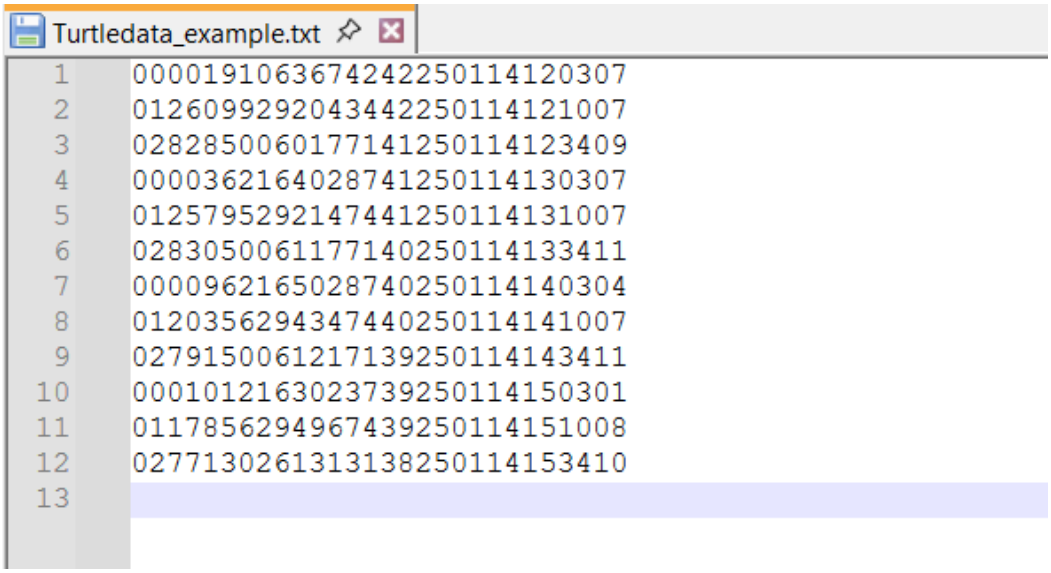

Figure 1: example file containing 12 samples for three different trackers

Number Breakdown

Digits 1-2 of every line specify what the turtle ID is. Each transmitter is given a unique two digit number during the creation process, so transmitters won't get mixed up with each other. Figure 2 is an example of a turtle with ID 00.

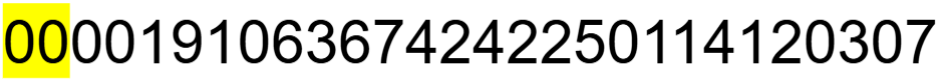

Figure 2: Digits corresponding to turtle ID in example sample

Digits 3-8 correspond to the receiver location along the North/South axis in position coordinates (not lat/long). Because the receivers are placed within Schenck, we know that the first 4 digits of coordinates will be 3549.xxxxxx (if first int is <5) and 3548.xxxxxx (if first int is >5). In figure 3, the first highlighted integer is a 0. Therefore, the coordinates recorded will be translated to 3549.001910.

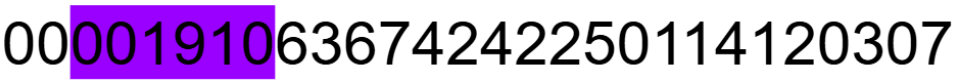

Figure 3: Precision digits corresponding to North/South in position coordinates

Digits 9-14 correspond to the receiver location along the East/West axis in position coordinates (again, not lat/long). Because the receivers will not leave Schenck, we know that the first 4 digits of coordinates will be -7843.xxxxxx. In figure 4, the coordinates recorded will be translated to -7843.636742.

Figure 4: Precision digits corresponding to East/West in position coordinates

Digits 15-16 are the battery voltage. In figure 5, 4.2 volts were read on the LiPo battery powering the transmitter. The battery stays at 4.2 when fully charged, quickly dropping to 3.6-3.8. It stays there for most of its life, then degrades towards 3.2. Below 3.3 is considered dead.

Figure 5: Digits displaying battery voltage

Digits 16-25 display the military time and date when the sample was collected. This time is in EST and accurately reflects daylight savings. The format is YY/MM/DD/HH/MM. Figure 6 calculates a sample taken at 12:03 pm on January 14th, 2025. If no satellites were found on the transmitter but the sample was sent regardless, time and date may be incorrect.

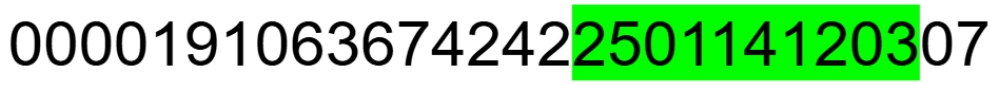

Figure 6: Time and date digits in the sample

Digits 26-27 represent the number of satellites for a given sample. Four satellites is the bare minimum for trilateration, and anything below may mean inaccurate location data.

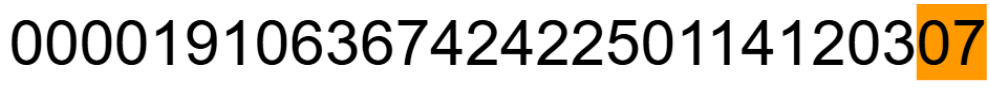

Figure 7: Digits corresponding to a sample's number of satellites