

A note on integration times in ezCol data collection programme in ezRA software suite.

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Article for SARA Journal Feb 2025.

Easy Radio Astronomy Suite (ezRA).

Ted Cline's free Easy Radio Astronomy Suite (ezRA, <https://github.com/tedcline/ezRA>) is widely used for the collection and processing of hydrogen line astronomy data by amateurs (1420.405MHz). Data collection is performed by the ezCol.py script within the suite. Its default setting is to integrate 31,000 samples in order to improve signal to noise ratio. This amount can be changed on the software's control panel.

Choosing an integration time.

The most common use of ezRA is to collect and process hydrogen line data from 24-hour drift scans of the Milky Way, where the radio telescope is pointed in the same direction in azimuth, and data is collected over full 24-hour periods. Elevation is changed between scans and the software calculates where the aerial was directed at each moment and presents this data on a number of plots.

For radio telescope aerials in the 1m range, an ideal integration time is around 4 to 5 minutes. The number of samples that need to be integrated in ezCol to achieve this time period will vary from computer to computer, depending upon the processing power and RAM of the host machine.

The "perfect" integration time in ezCol.

The number of samples required in ezCol to achieve 4 to 5 minutes per integrated sample was determined for both the LRO-H1 radio telescope, based on an ex-military 86cm x 86cm dipole array, and the LRO-H2 radio telescope, built around an 150cm parabolic solar cooker dish.

86cm dipole array: LRO-H1 – Integration number in ezCol 280,000 = 5.6 minutes single integrated sample.

150cm parabolic solar cooker dish: LRO-H2 = Integration number in ezCol 550,000 = 4.7 minutes single integrated sample.

Further information.

Further information about this project is available on the www.astronomy.me.uk website or by contacting me using the "contact us" page on that website.