

## APPENDIX No. 1

On this appendix you can see a copy of the Department of Mathematics homepage and the Astronomical Observatory Webpage and learn how to get to the “Arquivo de Observações Solares” (Solar Observations Archive).



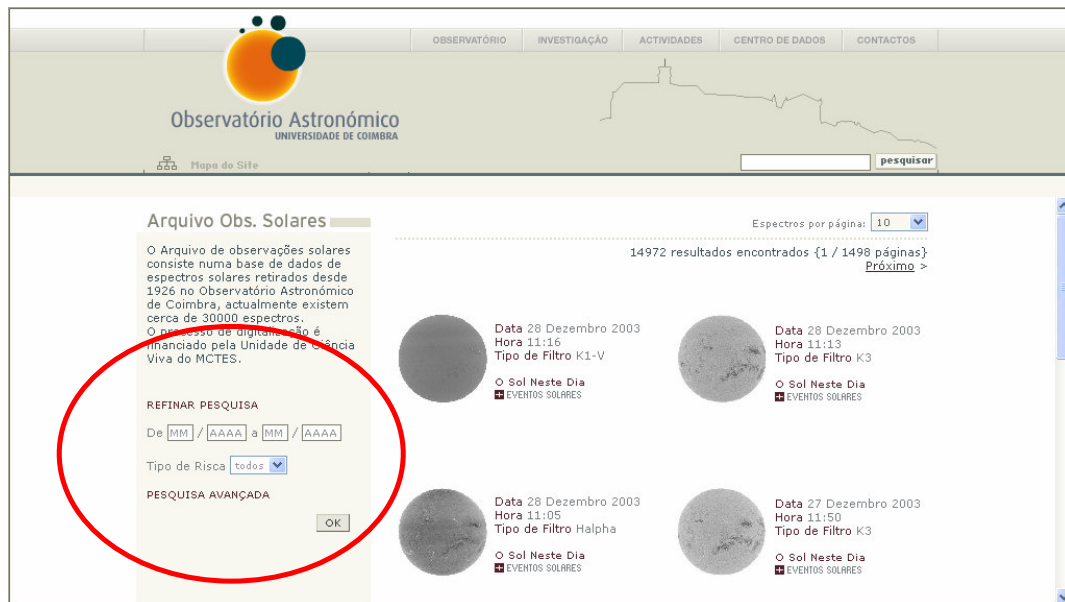
Figure A1.1: Link to the Astronomical Observatory through the Homepage of the Department of Mathematics.



Figure A1.2: Webpage for the Astronomical Observatory on the WebOnCampus of the University of Coimbra, with the link to the official Astronomical Observatory Webpage.



**Figure A1.3:** Official Web page of the Astronomical Observatory and the link to the “Arquivo de Observações Solares”



**Figure A1.4:** “Arquivo de Observações Solares”: the research menu by dates and lines.

## APPENDIX No. 2

This appendix serves to acquaint the reader with Paint application for inverting colours of spectroheliograms. Paint is a default application for Windows and you can access to it through the green button (“Start”) on the left lower corner (see indication on red). After opening Paint, the screen shows an image similar to the one on figure A2.1.

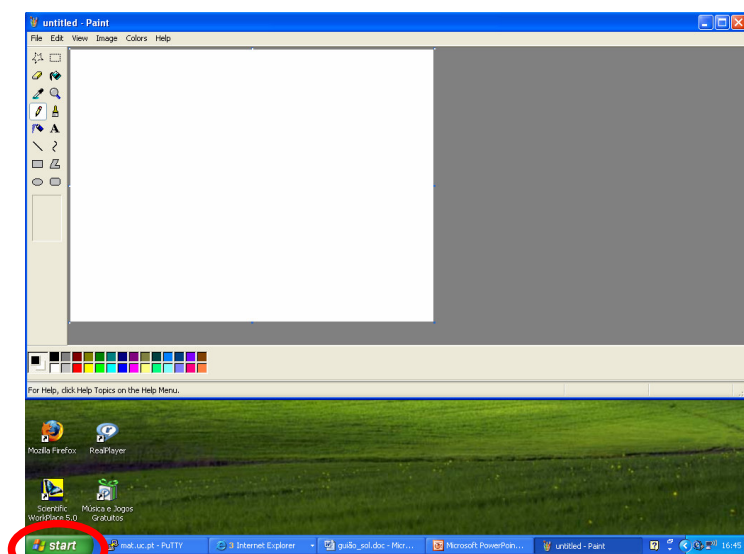


Figure A2.1: Drawing software Paint.

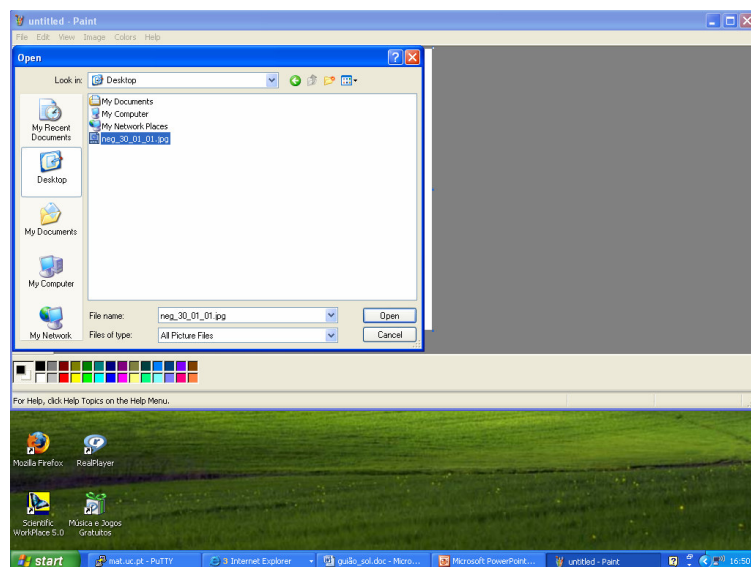
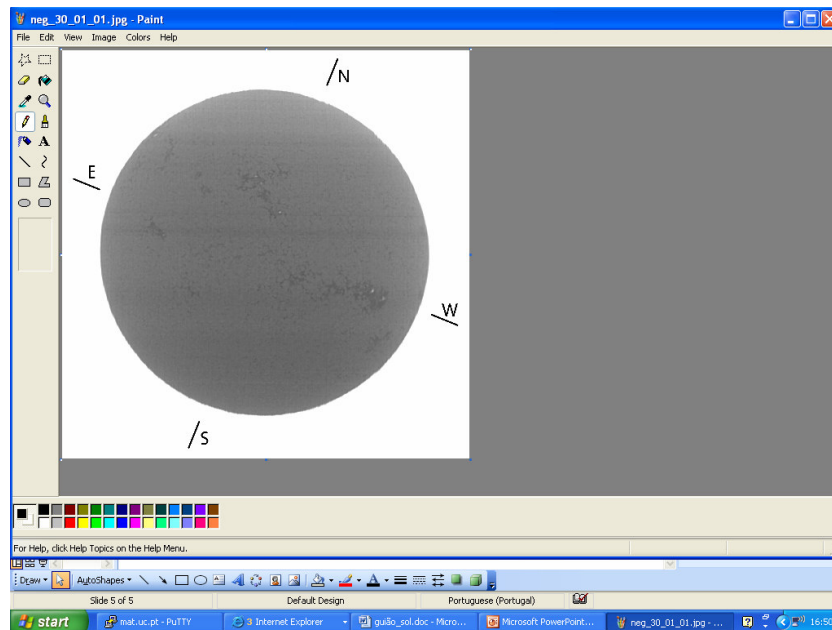
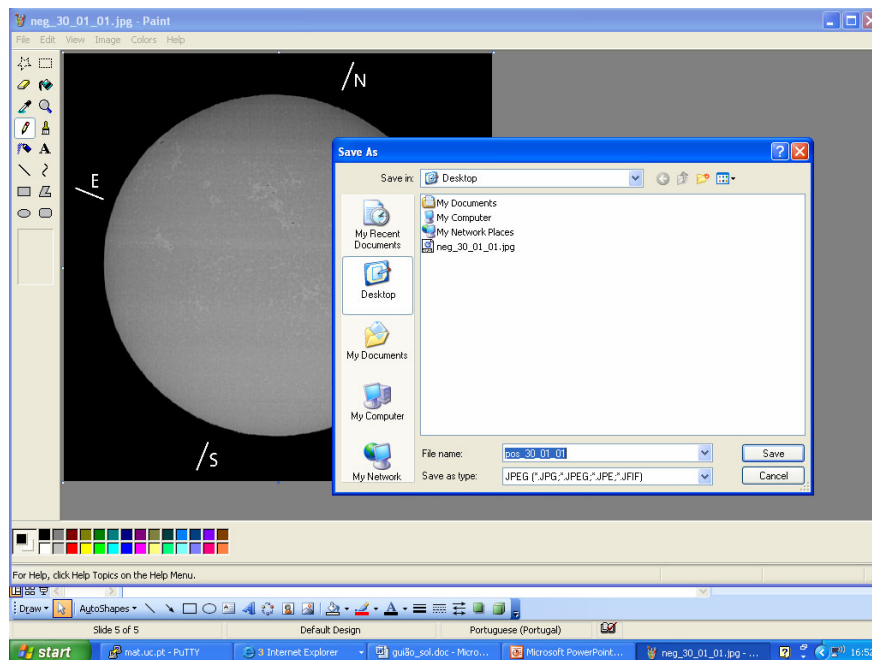


Figure A2.2: Open a previously saved file of a spectroheliogram with “Paint”.



**Figure A2.3:** Now that you have an image to work on, choose the option “Insert Colour” on the “Image” menu.



**Figure A2.4:** Result obtained by colour inversion and file storage under an appropriate name.

### APPENDIX No. 3

This appendix serves to exemplify the usage of “Excel Application Software”, not only for inserting data, but also for working up results. As an example we present the model file called “11 year\_cycle.xls” (which is not exactly like the one of the activity)

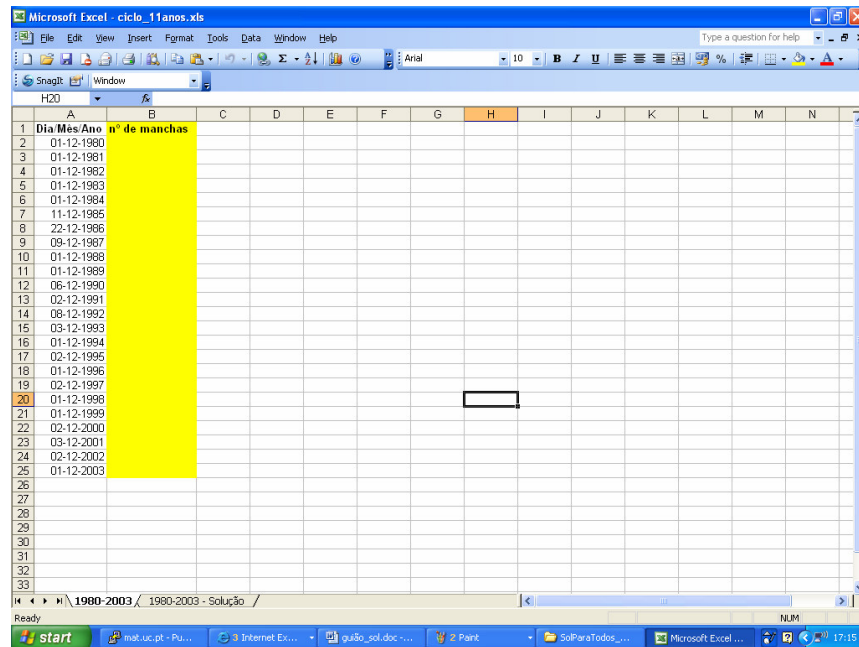


Figure A3.1: Model file.

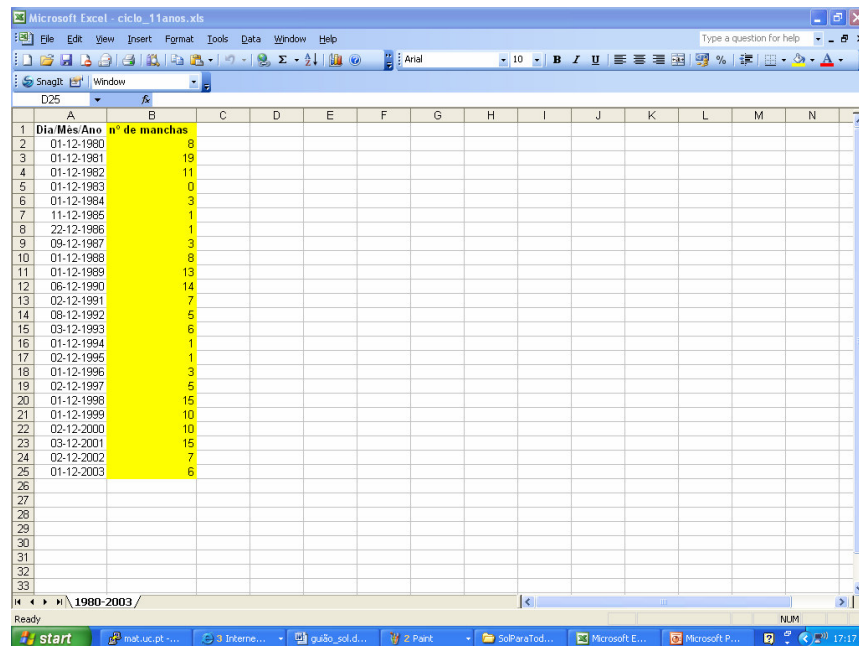
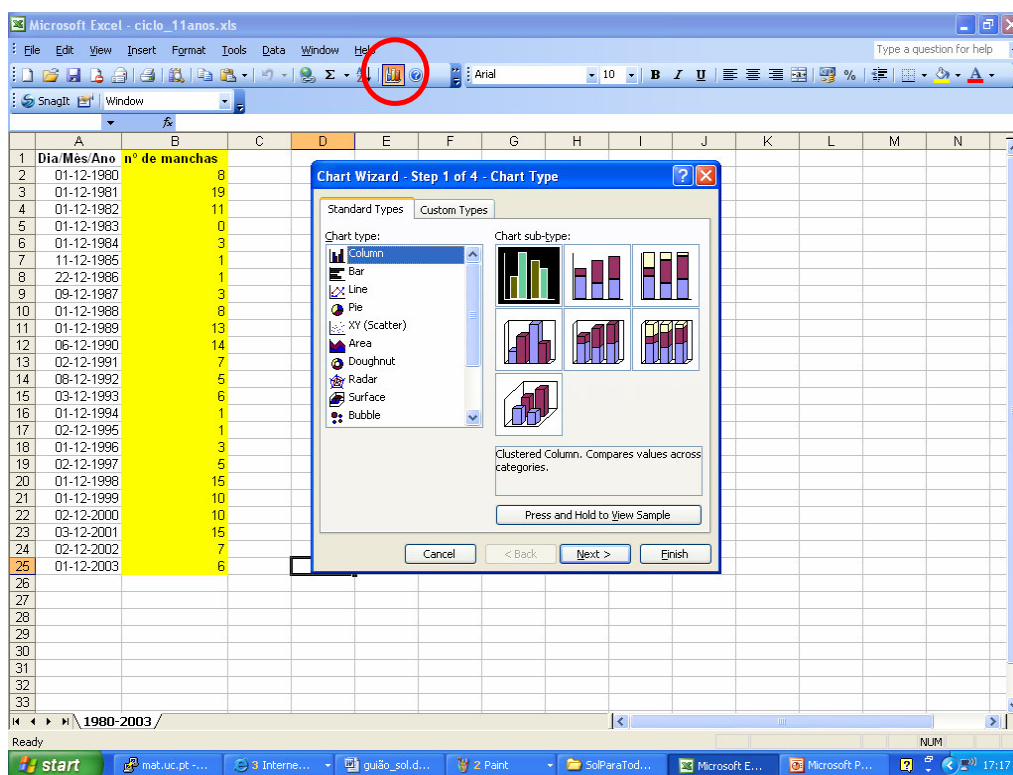
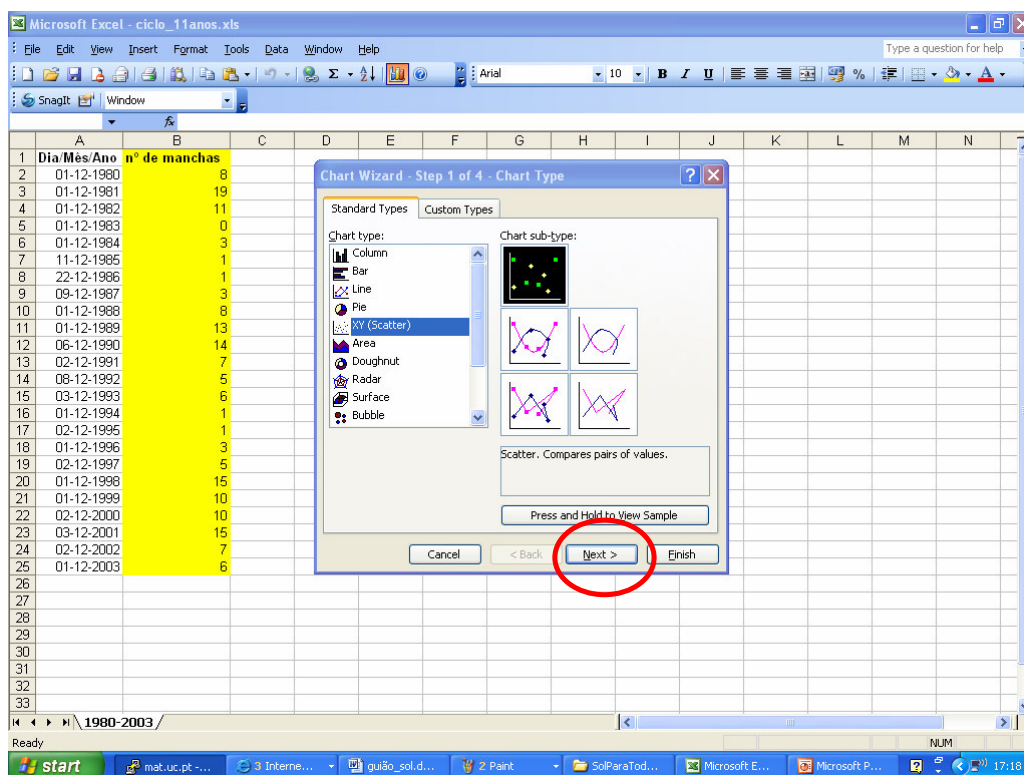


Figure A3.2: The yellow column is filled up with the number of observed sunspots in each of the spectroheliograms.





**Figure A3.3:** Select the option “graphic”, marked on the figure.



**Figure A3.4:** select the graphic type. In this case should be the option “XY (Scatter)”. Continue by selecting “Next”.

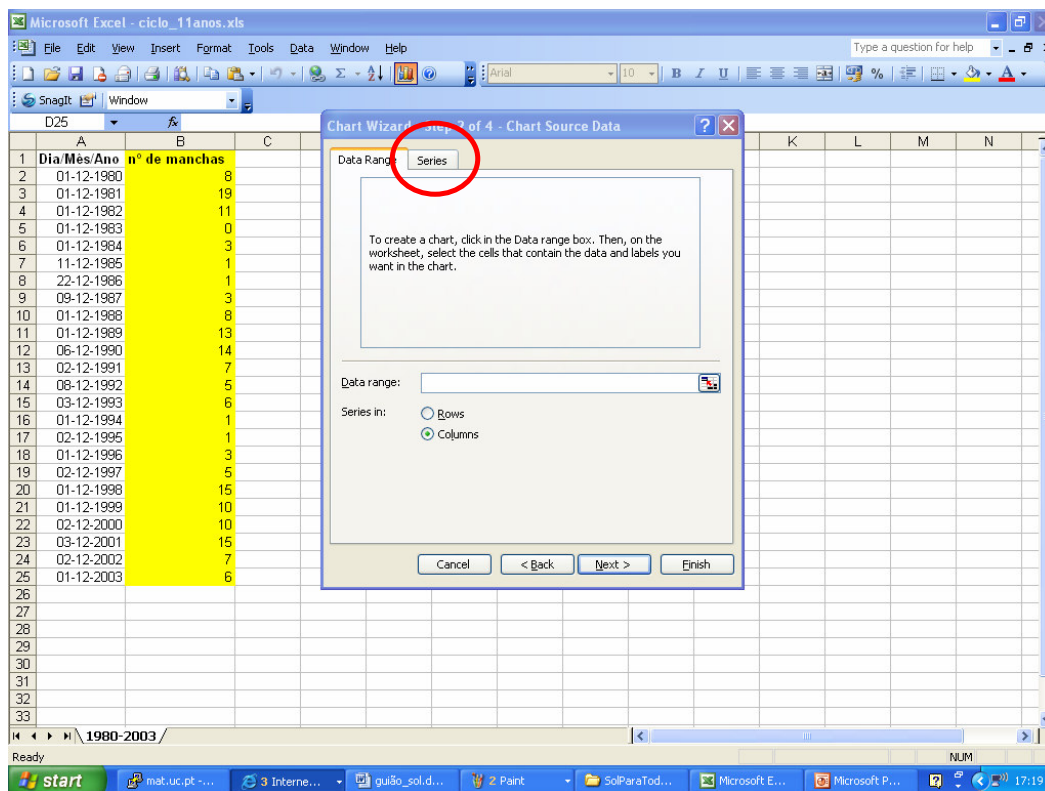


Figure A3.5: Select the graphic by column and choose "Series".

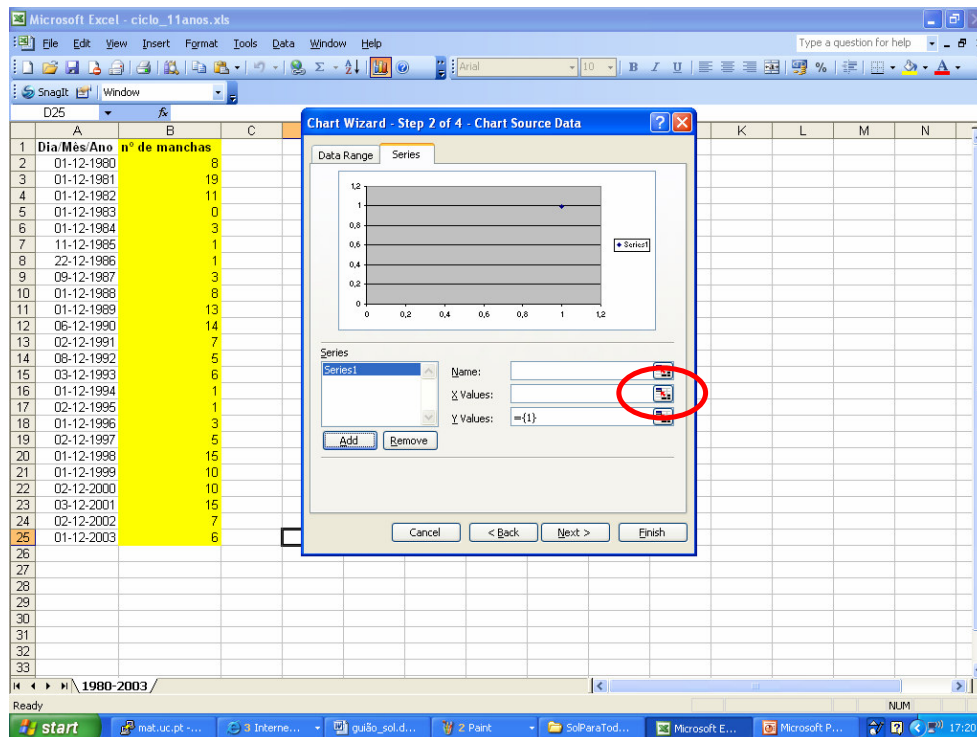
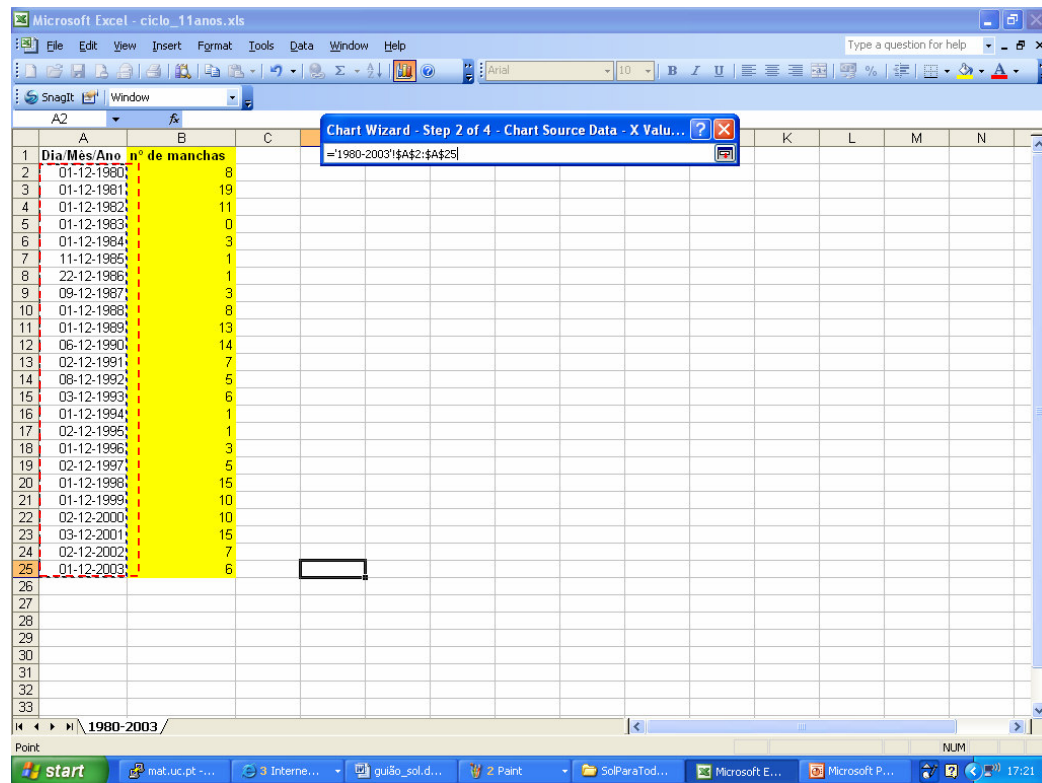
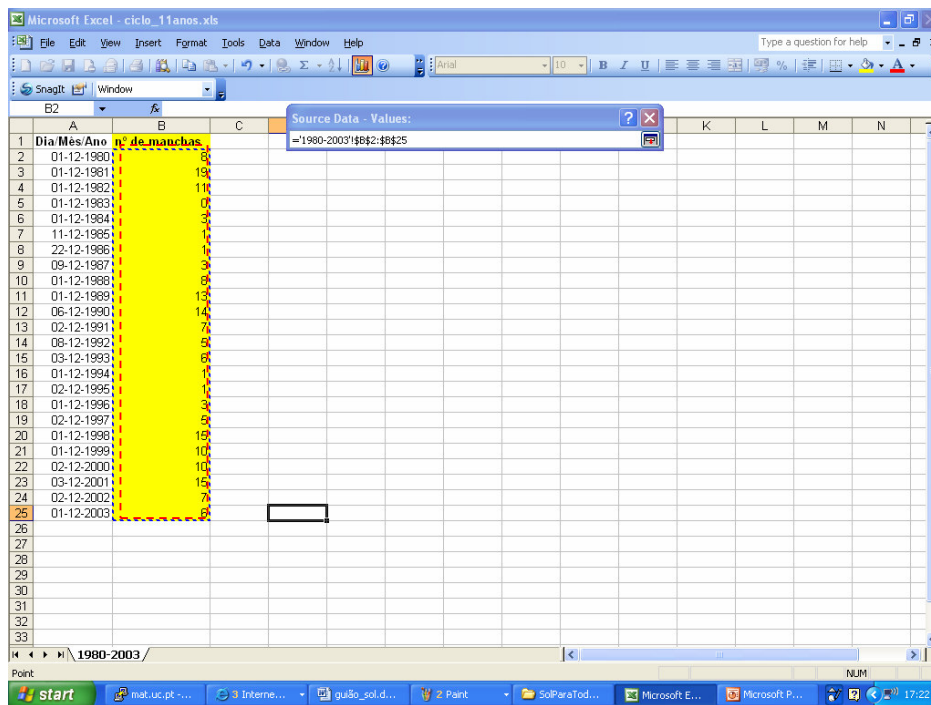


Figure A3.6: Select the XX axis.

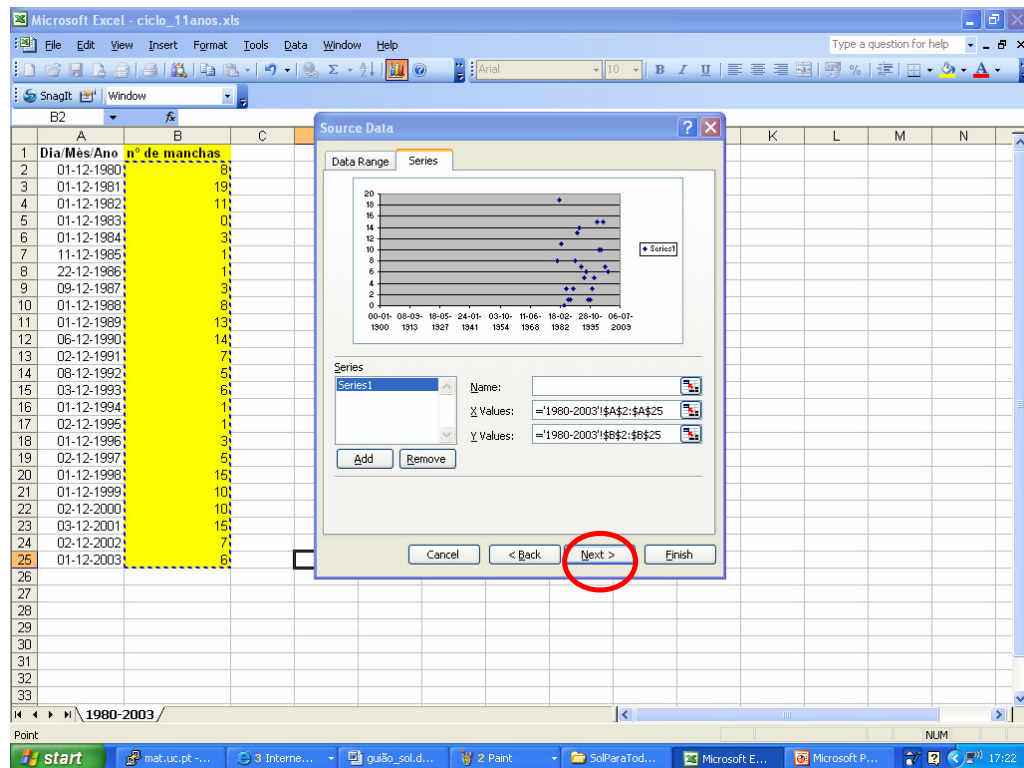


**Figure A3.7:** Using the mouse, select which of the columns is going to be associated with the XX axis.

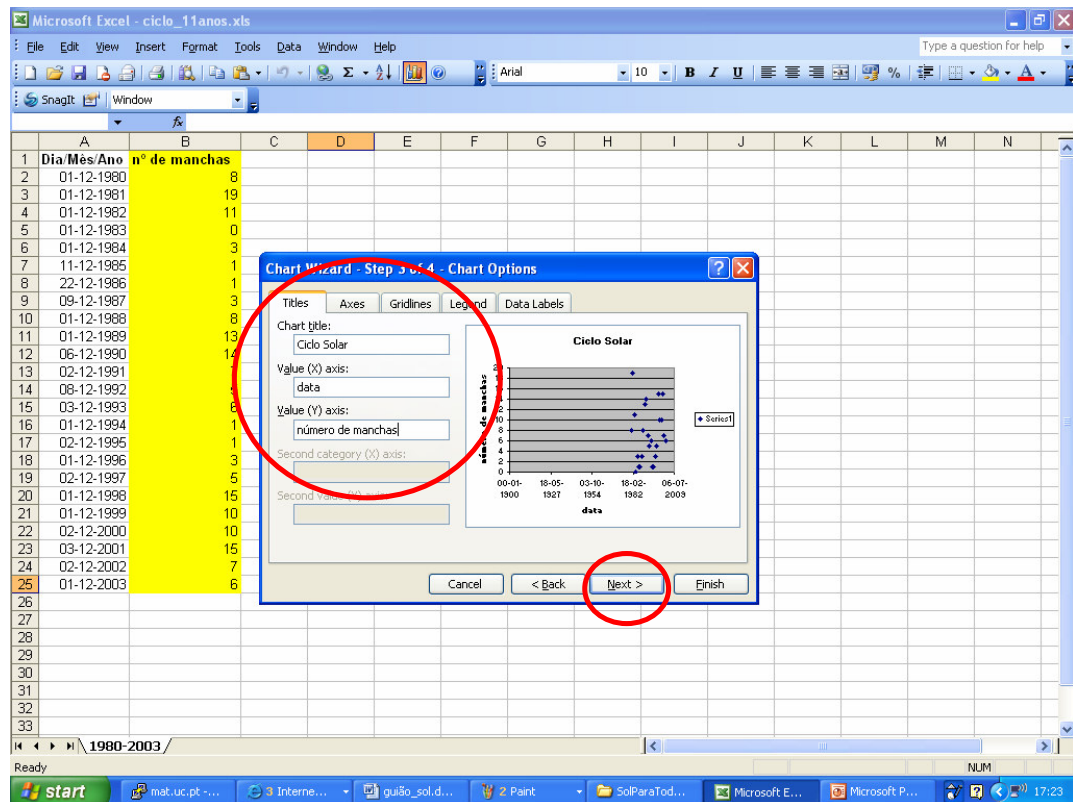


**Figure A3.8:** Proceed similarly for the YY axis.

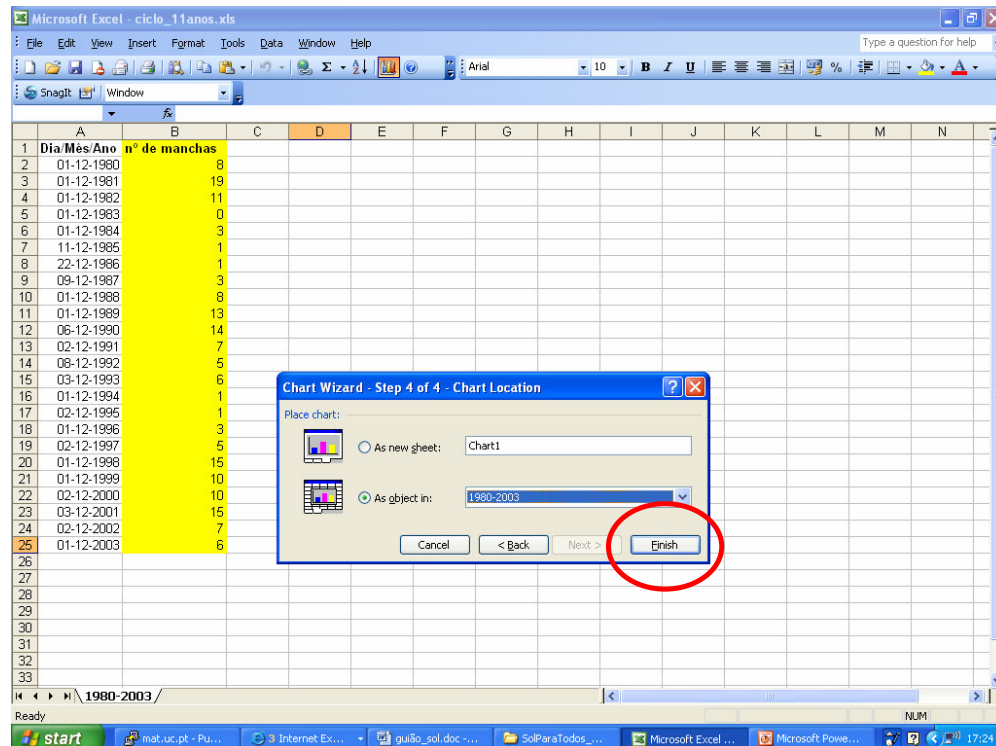




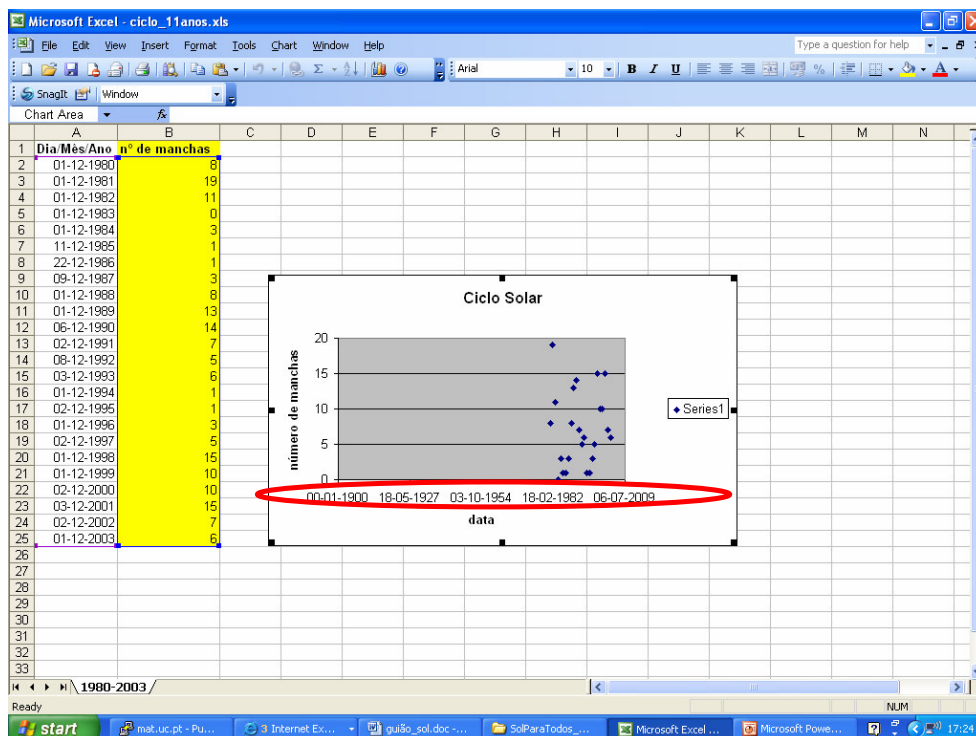
**Figure A3.9:** The graphic is automatically built. Now some formatting operations are needed. Select “Next”.



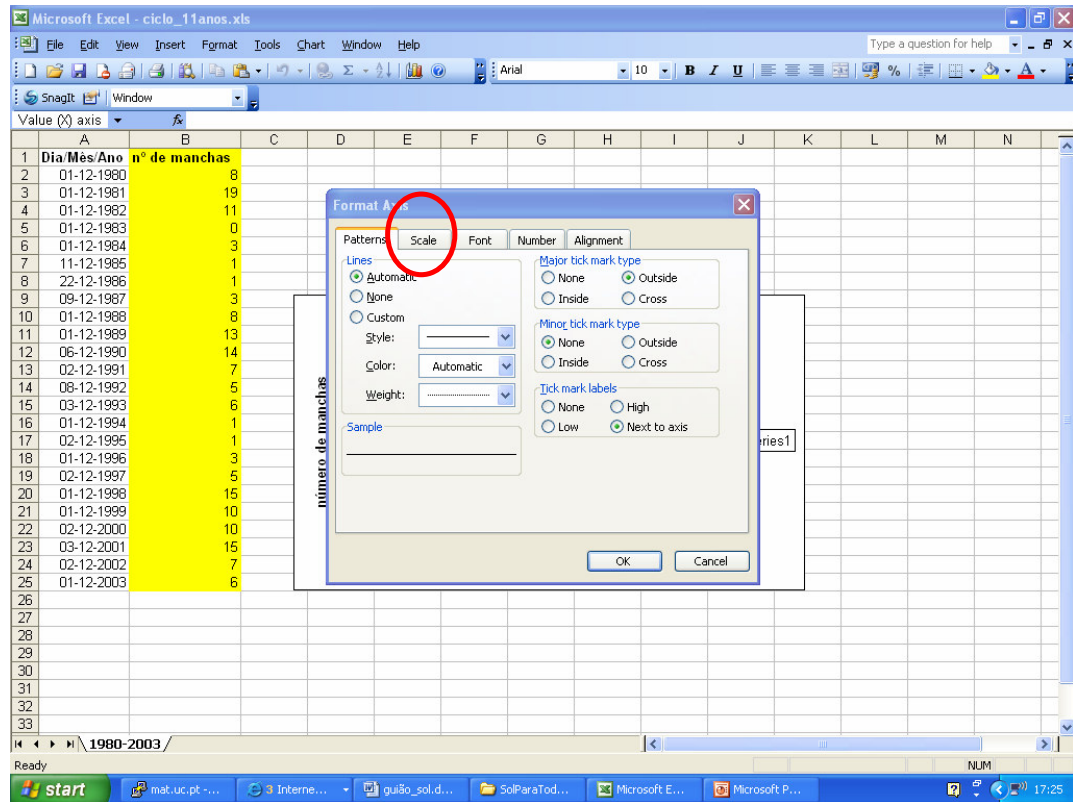
**Figure A3.10:** Fill in with the information related to the graphic title and the names of the XX and YY axes. Select “Next”.



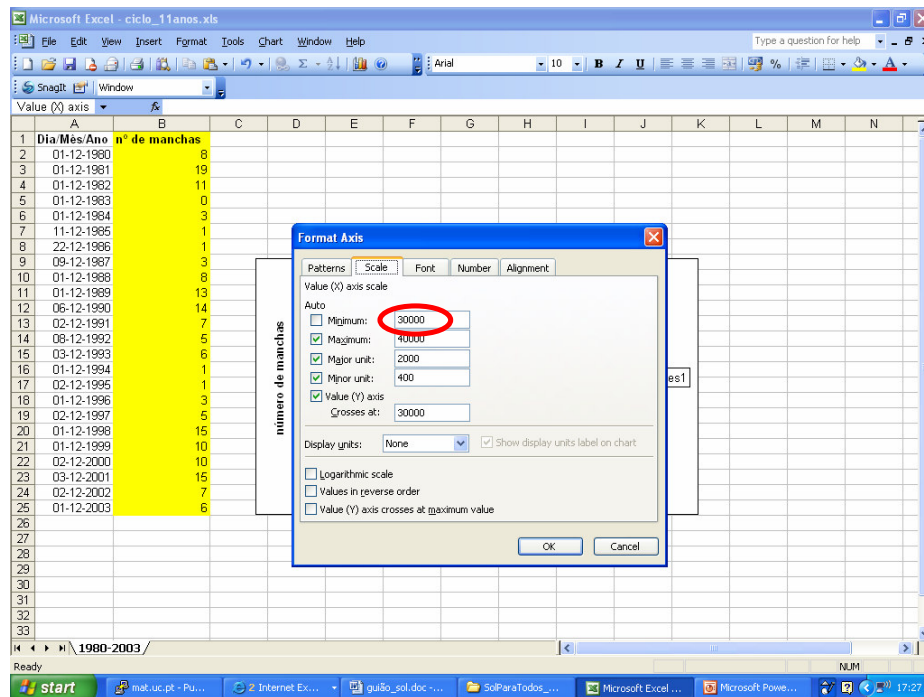
**Figure A3.11:** If you wish to save the graphic inside the spreadsheet, select “As object in”; if not, select the upper option. Then select “Finish”.



**Figure A3.12:** The graphic is done. However, some of the axis might not show the expected intervals of variation. That is the case here for the XX axis. Select the whole axis.



**Figure A3.13:** This menu is responsible for the XX axis format. Select “Scale”.



**Figure A3.14:** Change to the necessary length. In this case, the minimum length.

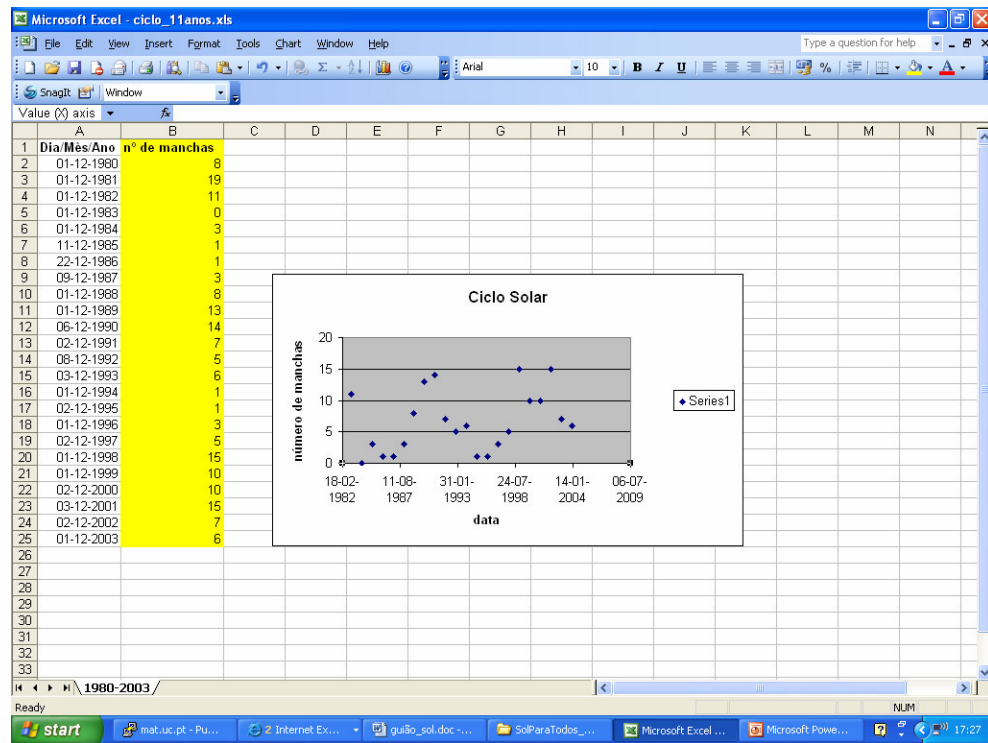
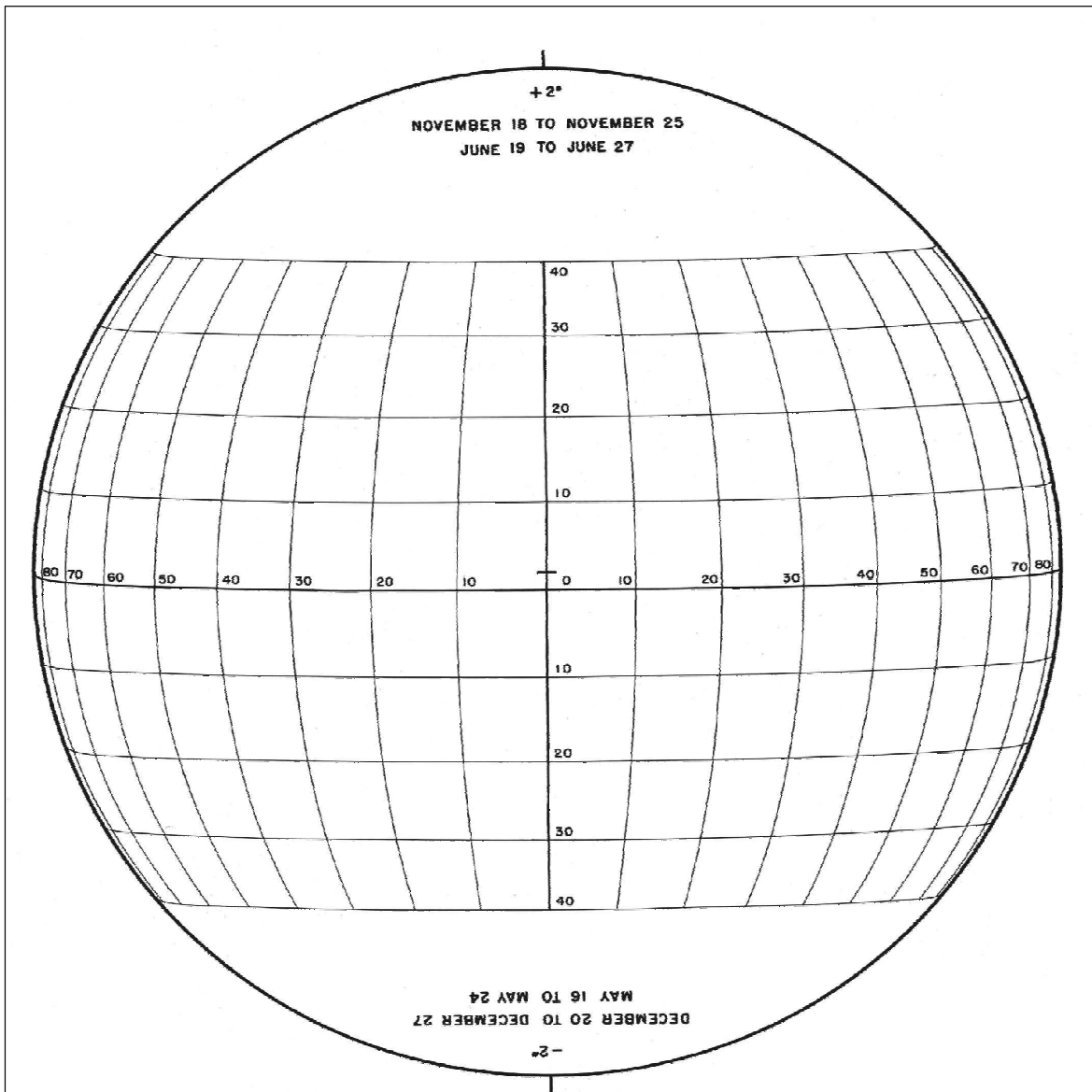


Figure A3.15: Finished and suitably format.

## APPENDIX No. 4



**Figure A4.1:** Stoneyhurst Disc (to be used only for the indicated dates. For other dates see the main text).