

The aim of the current project was to develop an electronic tool-point control on a telehandler. The automatic system could be developed which can limit the extension of the telescope according to the maximum horizon adjusted in the controller via a display. The telehandler exists in reality in Nordborg, Denmark in the Danfoss ADC. A similar system already exists but it uses high-cost sensors. The aim was to find a cheaper alternative solution to solve the horizon problem. During this project components were chosen according to the solution's needs. The Danfoss hydraulic and electric components used in the telehandler were described. A positional and an angle sensor were chosen.

This project has two main parts: mathematical calculations and a simulation of the telehandler extension and boom functions. The results of the two parts were compared to find a tolerance between the ideal ( datasheet ) and real ( simulation ) values.

Trigonometry and the theory of dependency were used during the calculations. The average speeds of the telescope cylinder were found and with their help from the dependence of the displacement of the spool, a theoretic cylinder position was found and compared to the real position, which was found during the simulations of the model.

During the simulations, an Optimization Toolbox in MatLab was used to optimize the spool, which changed the spool configuration values, so they are as close to the datasheet values as it is possible to be. After the optimal values were found, they were integrated into the model of two telehandler functions. The model was simulated and the speed of the cylinder with the different spool displacement signals was found. It was compared with the calculated results and the allowed tolerance was found.

A solution to limit the maximum horizon value of the machine and to control it with the help of three positional sensors was found. The calculations and simulations during this project have helped us to find all the necessary data to integrate this solution with the telehandler's controller. To summarize, we can say that during this project an alternative solution for the electronic tool-point control on a telehandler was found and simulated