

ABSTRACT

Design and Construction of a Computer

Controlled Industrial Robot.

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Generally, two parameters determine the type of programmable controller and mechanical design of an industrial robot. These are the driving force for each axis, which can be hydraulic, pneumatic or electric, and the job application of the robot.

This report details the design, fabrication and testing of a robotic system capable of performing a wide variety of jobs using electric and pneumatic actuators. Following a thorough investigation of robotic operating subsystems, a robot incorporating mainly mechanical components, a simple effective controller and an electronic braking mechanism, was designed and built. All electrical and electronic systems were derived and interfaced to a host computer. A primary consideration in the design was the capability of local/regional fabricators to reproduce the robot, modified as required on a limited commercial basis.

Experimental work was conducted using D.C. stepper motors to determine gear ratios, holding-torque to voltage ratios and motor repositioning for each axis so as to reduce torque requirements.

ACKNOWLEDGEMENTS

The robot was subjected to a testing programme and its performance evaluated.

The study has revealed that this technology, although in its developing stage locally, can now be realised fully, since the operating principles and concepts have been thoroughly examined and formulated.

The author also acknowledges the assistance given by Mr. Winston G. Lewis during the duration of study.

He acknowledges the help of machinists Mr. Martin Lee John, Mr. Edmund Joseph and Mr. Junior Moore in the fabrication of the Mechanical Systems, the technical assistance given by Mr. Horace Sobrassingh, Mr. Russell Joseph and all those in the Department of Mechanical Engineering who assisted in making this work a success.

The author also wishes to thank Ms. Sharon Joseph for her service in the typing of this thesis.

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