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# **A Computer Integrated Manufacturing System for Small Scale Production of Electronic Units**

A thesis presented in partial fulfilment of the requirements

for the degree of

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in

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# Abstract

This research project concerns the design of a rapid response, computer integrated Printed Circuit Board (PCB) Component Assembly System (CAS). The CAS system forms an integral part of a commercially viable Manufacturing Pilot Plant (MPP) for the design, production, and assembly of high quality special purpose PCBs in low volumes.

The design of the CAS system begins with the identification of the characteristics and deficiencies of conventional low volume, high variety PCB manufacturing systems.

Next, a vision for the MPP as a whole is presented, with particular emphasis on the CAS system.

A Generic Manufacturing System Design Methodology (GDM) is then derived, and is applied to the design of the CAS system.

Through the GDM a working CAS system is constructed, based around a central CAS Master and 3 assembly workstations.

The working CAS system is then analysed through a comparison with a typical conventional low volume manual assembly system. The results support the expectation of superior performance from the envisioned system.

Finally, areas requiring further work are identified.

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