

AIRCRAFT LOCATING SYSTEM

This report was submitted to the Department of Electronic and Telecommunication Engineering of the University of Moratuwa in partial fulfillment of the requirements for the Degree of Maser of Engineering.




University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

Department of Electronics and Telecommunication Engineering
University of Moratuwa
Sri Lanka


April 2008

The work presented in this dissertation has not been submitted for the fulfillment any other degree.



R. J. Pathirage
(Candidate)

University of Moratuwa, Sri Lanka
Electronic Theses & Dissertations
www.lib.mrt.ac.lk



Mr. Kithsiri Samarasinghe
(Supervisor)

ACKNOWLEDGEMENTS

I wish to record my sincere gratitude to Mr. Kithsiri Samarasinghe, my supervisor for his constant guidance, constructive criticism and invaluable advice for my research. Working under the supervision of Mr. Kithsiri Samarasinghe, is one of the grate opportunities I had in my life.

I thankfully acknowledge support of all other members of the academic staff of the department. Specially I remember with much appreciation the support given by Dr. Ajith Pasqual.

I am sincerely grateful to Mr. Salinda Tennakoon for his kind support regarding various issues through out the period of my research. A very special word of thanks to Flight Lieutenant Eranda Geeganage for his kind assistance in order to complete the project.

Also I am very grateful to Commander of the Air Force for allowing me to proceed with my research project and also provisioning of Y-12 Air Craft for the verification/Calibration flights.

Finally, I would like to thank once again, my supervisor (Head of the Department) Mr. Kithsiri Samarasinghe, for recruiting me as a research assistant.

Table of Contents

Acknowledgement	i
Abstract	ii
Table of Contents.....	iii
Chapter 1	1
Introduction.....	1
1.1 Justification of the Project	1
Chapter 2.....	3
Literature Review.....	3
Chapter 3	15
Sensor Subsystem	15
3.1 Position Sensor – Garmin GPS.....	15
3.3 Altimeter and Wind Speed Module	15
Chapter 4	18
On Board Processing Subsystem	18
4.1 Introduction.....	18
4.2 Data Interface Unit.....	21
4.3 On Board Computer.....	21
4.4 Software Architecture.....	23
4.5 Main Program.....	24
4.6 Difficulties faced & overcoming them.....	26
Chapter 5	27
Ground Monitoring Station Subsystem	27
4.1 Introduction.....	27
4.2 Archietecture.....	27
4.3 Display Subsystem.....	29
4.4 Technical Difficulties & Solution to overcome.....	31
Conclusion & Future work	32
Bibliography	33
Appendix 1 – Altitude & Pressure Relationship	35

Appendix 2 – Air Speed & Pressure Relationship.....	36
Appendix 3 - LTC1865 Features.....	37
Appendix 4 - PIC 16F877A Microcontroller Features.....	38
Appendix 5 - TS 7300 SBC Features.....	40
Appendix 6 - Garmin GPS 18 (5Hz) features.....	41
Appendix 7 - Kalman Filter.....	42



University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk