UNIVERSITI TEKNOLOGI MARA

COMPARISON ACCURACY BETWEEN STANDALONE GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) AND DIFFERENTIAL GLOBAL NAVIGATION SATELLITE SYSTEM (DGNSS) IN HYDROGRAPHY SURVEYING

MUHAMMAD HAFIZ BIN A AZIZ

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of the requirements for the degree of
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AUTHOR'S DECLARATION

I declare that the work in this disertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

Name of Student	:	Muhammad Hafiz Bin A Aziz
Student I.D. No.	:	2014797653
Programme	:	Bachelor of Surveying Science and Geomatics – AP220
Faculty	:	Architecture, Planning and Surveying
Thesis	:	Comparison Accuracy Between Standalone Global Navigation Satellite System (GNSS) and Differential Global Navigation Satellite System (DGNSS) in Hydrography Surveying.
Signature of Student	:	.....
Date	:	July 2018

ABSTRACT

Positioning plays a greater role in determining the accurate and precision of the target in hydrographic surveying. There are several methods for observation technique to obtain position in Global Navigation Satellite System (GNSS) surveying. Many factors can affect the accuracy and precision of the target between Standalone Global Positioning System and JUPEM Differential Global Positioning System. Thus, purpose of this study is to compare the accuracy of Standalone GNSS and JUPEM DGNSS in hydrographic surveying. The achievable accuracy will be determined either the capabilities of Standalone GNSS and JUPEM DGNSS are in line with IHO standard accuracy to special order, first order and second order which is 2m level. In order to determine the accuracy of both Standalone GNSS and JUPEM DGNSS, a single sounding line has been created on the ground at study area using RTK method. After that, the sounding line will be observed using Standalone GNSS and JUPEM DGNSS separately due to the limitations of the instrument and it cannot be done simultaneously. A trolley will be used to imitate the motion of a boat but the speed is very slow compare to the normal speed of a boat for hydrographic surveying. The data that has been obtain will be process in multiple software such as AutoCad for filtering and Micrsoft Excel for calculating the residual and RMSE to determine the accuracy for each of the method. As a result, the accuracy of the standalone GNSS and JUPEM DGNSS are in line with the accuracy provided by IHO which is below two meter accuracy. From the research, the horizontal accuracy of JUPEM DGNSS positions is in the range of one meter to two meter. With this range of accuracy, it is suitable for hydrographic positioning utilize the JUPEM DGNSS services more effectively. As for further research, both of the method should been done simultaneously on the water areas using a boat like actual job in hydrographic surveying.

TABLE OF CONTENT

		Page
CONFIRMATION BY PANEL OF EXAMINERS		**1**
AUTHOR'S DECLARATION		**2**
ABSTRACT		**3**
ACKNOWLEDGEMENT		**4**
TABLE OF CONTENT		**5**
LIST OF TABLES		**8**
LIST OF FIGURES		**9**
LIST OF GRAPHS		**11**
LIST OF ABBREVIATIONS		**12**
CHAPTER ONE INTRODUCTION		**13**
1.1	Introduction	13
1.2	Research Background	13
1.3	Problem Statement	15
1.4	Aim	15
1.5	Objectives	16
1.6	Scope of Work	16
	1.6.1 Data Source	16
	1.6.2 Data Processing	17
1.7	Significant of Study	18
1.8	Limitation of Study	18
CHAPTER TWO LITERATURE REVIEW		**19**
2.1	Introduction	19
2.2	Global Navigation Satellite System	19
2.3	Differential Global Positioning System	21
2.4	Malaysian Real-Time Kinematic Network (MyRTKnet)	22
	2.4.1 Concept of MyRTKnet Services	24

2.5 Accuracy of Hydrographic Surveying 25
2.6 Dilution of Precision 27
2.6.1 Geometric Dilution of Precision (GDOP) 30
2.6.2 Position Dilution of Precision (PDOP) 31
2.7 Evaluation Technique 31
2.7.1 Average (AVE) 31
2.7.2 Standard Deviation (STD) 32
2.7.3 Root Mean Square Error (RMSE) 32

CHAPTER THREE RESEARCH METHODOLOGY 33
3.1 Introduction 33
3.2 Research Methodology 34
3.3 Preliminary Study 35
3.4 Data Acquisition 36
3.4.1 Malaysian Real-Time Kinematic Network (MyRTKnet) 37
3.4.2 HydroPro Configuration 37
3.4.3 Non-Differential GNSS Observation 44
3.4.4 JUPEM Differential GNSS 44
3.4.5 Dynamic Mode 46
3.5 Data Processing 47
3.5.1 Processing Coordinated 47
3.5.2 Filtering 48
3.5.3 Residual and Standard Deviation 48
3.6 Result and Analysis 49

CHAPTER FOUR RESULTS AND DISCUSSION 50
4.1 Introduction 50
4.2 Difference in Easting and Northing for Standalone GNSS and JUPEM DGNSS 50
4.2.1 Observation using Standalone GNSS 50
4.2.2 Observation using JUPEM DGNSS 51
4.3 Residual in Easting and Northing for Standalone GNSS and JUPEM DGNSS 52