GEODESY IN MALAYSIA

National Report 2000-2003

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PREFACE

The Department of Survey and Mapping Malaysia (JUPEM) is an organisation within the Ministry of Land and Cooperative Development. The Geodesy Section is under the Mapping Division and is devoted to all geodetic works across the nation. Apart from this and of particular importance is the promotion of international cooperation and national coordination.

This national report describes the role of the Geodesy Section which includes the objectives, functions and activities undertaken. It covers the geodetic activities and follows the structure of the International Association of Geodesy (IAG) report.

This report is divided into the following sections:

1. Positioning
2. Advanced Space Technology
3. Determination of the Gravity Field
4. General Theory and Methodology
5. Geodynamics
6. Bibliography

I would like to express my appreciative thanks to those who have contributed to this report and who are promoting the science of geodesy in Malaysia.

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Department of Survey and Mapping Malaysia
June 2003

INTRODUCTION

1. Preamble

The Department of Survey and Mapping Malaysia (DSMM) is a government agency under the Ministry of Land and Co-operative Development which acts as the technical advisor to the Government of Malaysia on all matters pertaining to surveys and mapping in the country. It is the sole governmental body which maintain the Malaysian Spatial Reference Frame for various works such as for geodesy, mapping, engineering, cadastral, scientific, geodynamics and creations of Geographical/Land Information Systems.

The Department of Survey and Mapping, Malaysia (DSMM) traces its origin back in 1886. The 1880s also marked an important phase with the commencement of more widespread trigonometrical works in various parts of Malaya. The first attempt at triangulation survey was made in Penang in 1832 by Lieutenant Woore of the Royal Navy.

The labour intensive traditional methods of conventional geodetic surveys have basically ceased with the advent of GPS. No major field activities have been undertaken except for monitoring of subsidence and building structures in urban areas particularly the cities and major towns. In the subsequent years, there have been numerous geodetic projects implemented by DSMM on a nation wide scale. Collectively, these projects were and are executed with the final aim of providing horizontal and vertical controls for the development of various infrastructures across the country.

In Malaysia, research in geodesy is also undertaken through academic institutions, principally funded by the Ministry of Science, Technology and Education. Information about the national geodetic infrastructure can be obtained from the Geodesy Section, Mapping Division, DSMM.

2. The Role of Geodesy Section

2.1 Objectives

- To collect, process, analyse, store and distribute accurate geodetic, tidal, astronomy and magnetic data in accordance to the departmental specifications and work procedures

- To provide a comprehensive service in the fields of geodesy, astronomy and magnetic to an acceptable level to meet the nation needs.

2.2 Functions

- To perform geodetic projects as follows:

- Global Positioning System (GPS) project for the determination of Geodetic and Scientific Networks as well as the coordinates of stations
- Geodetic Vertical Datum projects that include Tidal Water Observation Project, Precise Levelling Project and Gravity Project.
- Collaborative projects with local and overseas institutions and agencies

- To plan and perform:
  - GPS control surveys
  - Precise levelling using motorised and automatic digital levelling techniques
  - Second class levelling
  - Gravity survey
- To identify and perform all forms of research in the field of geodesy for mapping and scientific purposes.
- To carry out computations and astronomical observations to determine positions on earth and religious matters such as the direction of Qibla, prayers' times, new moon observation and others.
- To operate and maintain Tidal Gauge Stations and publish annual Tidal Prediction Tables and Tidal Observation Record.
- To prepare, archive and distribute records and documentation of all geodetic data.

3.0 Directions

DSMM holds more than a century-old proud record of serving the ever-changing needs of the Government, the military and the general public. It is promoting itself to be a centre of excellence for all survey and mapping activities in Malaysia. It also aims to provide an efficient and high quality land survey and mapping services that include the dissemination of geodetic information in line with the national requirements.

The rapid socio-economic development and progress undertaking in Malaysia has increased the demand for improved surveying, mapping and geographic information dissemination services. With the country enjoying vigorous growth and the government supporting the growth of the spatial information industry, the challenge is for the DSMM to evolve strategies and structure such that it is well positioned to continue to serve the needs of the nation.

DSMM is continuously keeping abreast with the technology in order to provide efficient and up-to-date services and products to the government and the general

public. This ability to succeed will depend primarily on innovation, understanding of user's needs, maintaining accurate and quality products and on reducing cost and time. In its effort to harness the prowess of modern technologies to meet the inundating needs of the increasingly sophisticated clientele from both government and private sectors, DSMM is beginning to embark on an extensive and continuous exercise to revise the present geodetic networks.

In this new millennium, there is an ever-increasing demand for geodetic products. Thus, DSMM will continuously formulate and undertake its modernisation programmes by introducing new strategies in areas of surveying and mapping. With this effort DSMM will be in position to achieve its mission and objectives in line with Malaysia's Vision 2020.

Further information on our products and services can be obtained by writing to:

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