MILITARY GEOGRAPHIC SERVICE OF BULGARIAN ARMED FORCES

Geospatial capabilities, spatial data and services provided by Military Geographic Service

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1. INTRODUCTION
   - Workflow
   - Data sources – remote sensing, direct field observation.

2. THE PRIME GEO DATA BASE (GDB 25)

3. Workflow of Digital cartography

4. Services for providing of spatial data and cartographic products.
Military Geographic Service (MGS) is a body of MoD to perform all necessary activities to create geoinformation products (maps, charts, analysis of the terrain, digital data for the area and other geographic information) and provide them the armed forces and public authorities and structures, as well as providing specialized technical assistance.

The mission of Geographical Service as a member of NATO is to provide both Bulgarian and armed forces of the member states of NATO with geographical information, especially in planning, training and execution of all types of operations.
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SOURCES OF INFORMATION

Main sources of information are:
- airborne- and satellite-based remote sensing techniques (aerial and satellite images) and field observations

Additional sources:
- Bulgarian Air Forces;
- Hydrological service;
- Ministry of Regional Development and Public Works;
- Ministry of Investment Planning;
- Ministry of Agriculture and Food;
- Ministry of Environment and Water;
- Ministry of Transport, Information Technologies and Communications;
- Bulgarian Air Traffic Service Authority;
- Aerospace Observation Centre etc.
The ultimate goal in the processing of digital images is to remove all distortions (geometric and radiometric) and transforming them into models and images, allowing direct geometric measurements.

**SOURCE DATA** - aerial and satellite images with - ground simple resolution of approximately 0.4 sm. and better.

**SOFTWARE** - Erdas Imagine, Leica Photogrammetry Suite LPS;

**PRODUCTES**
- stereo model;
- DEM, DTEM;
- Ortho images.
Used by MGS data coming from remote sensing allows obtaining models with a vertical accuracy up to 1 m.
ORTHORECTIFY IMAGES

Orthophoto images are the main source of vector information for building and updating the GDB25.

Main indicators for control:
- Geometric accuracy;
- Radiometric image quality.

SOFTWARE – ArcGIS

METHOD for collection of vector information - "On screen" vectorisation
The stereo mapping is another way to derive vector and attribute information.

**SOFTWARE** – Stereo Analyst for Erdas Imagine

**METHOD** for collection of vector information – stereo mapping

Structuring of the data in stereo mapping process.

In the workflow of MGS the stereo mapping is used only for extracting information about the objects which are not recognized on the ortho photo images.
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PRIME GEO DATA BASE (GBD25)

The main part of the activities of the MGS is aimed to create, maintain and update the prime geo data base (GDB 25)

SOFTWARE – ESRI - ArcGIS for Server, ArcGIS Desktop

THE CHARACTERISTICS OF THE PRIME GEO DATABASE ARE:
1. Accuracy - covering requirements for the creation of cartographic materials in scale 1:25 K;
2. Coordinate system - WGS 84, geographical coordinates (B, L);
3. Vertical coordinate system – EVRS 2007;

THE DATA MODEL INCLUDES 648 FEATURE CLASSES:
- Point Feature Class - 252
- Line Feature Class - 152
- Polygon Feature Class - 75
- Text Feature Class - 169

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PRIME GEO DATA BASE (GBD25)

Data model
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VERIFICATIONS

1. Actuality
2. Accuracy
3. Geometric fidelity
4. Attribute Fidelity
Topological verification - using combinations of topological rules.
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PRIME GEO DATA BASE (GBD25)

Verifications of attributes

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The activities of Military Geographic Service in the sphere of cartographic production are determined by:

- **Responsibilities, due to the membership of Bulgaria in NATO**
  - Tactical Line Map (TLM) in scale 1:50K;
  - Join Operation Graphic (JOG) in scale 1:250K.

- **The Law on Geodesy and Cartography of Republic of Bulgaria**

- **SOFTWARE** - ESRI company - ESRI Production mapping
WORKFLOW OF CARTOGRAPHIC PRODUCTION

The used technology combining advanced hardware solutions, high-tech software and well-trained staff.

Main purpose:
1. To obtaining up-to-date cartographic products with high quality and precision
2. To reduce the production time and cost of map products.
CUSTOMIZATION:

- Creating cross reference tables for proper extraction and importing the information from GBD 25 to geo databases VMAP1 and VMAP 2;
- A system of symbols for all object classes for scales 1:50K and 1:250K together with their attribute tables;
- The rules for visualization of attributes, colors representations, etc;
- The templates for automatic generation of marginal information;
- Set of rules for automatic generalization of information importing from GDB25;
- Cross reference tables transforming the screen colors (RGB) to standard ones (PANTONE) for press of hard copy maps.
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TLM
Topographic Line Map
M 1:50,000

JOG AIR
Joint Operation Graphic
M 1:250,000

JOG GROUND
Joint Operation Graphic
M 1:250,000

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GEOPORTAL of MoD – WWW.GIS.ARMF.BG

GENERAL PURPOSE:
Improving the quality of administrative services of the public administration, citizens and businesses by establishing a system for access to spatial data.

SPECIFIC GOALS:
1. Creating conditions for public access to electronic services for the spatial data whose owner (holder) is MoD.
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E-services
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DETAILS OF E-SERVICE
The status of the request
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Providing on
SPATIAL DATA
and
NETWORK SERVICES
as required by European Directive
INSPIRE

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GeoPortal of MoD provide:

1. E-services – 34.

2. Spatial data according to the requirements of the European INSPIRE directive – 6.

3. Network service according to the requirements of the European INSPIRE directive – 3.

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THE QUALITY IS ALWAYS A RESULT FROM INTELLIGENT EFFORTS

QUESTIONS?

END