

NATO Armaments Ballistic Kernel (NABK)

Part of the SG/2 Shareable (Fire Control) Software Suite (S⁴)
 The Firing Tables and Ballistics Division of the US Army's RDECOM-ARDEC leads the NABK project within the S⁴. The major contributing organizations to the NABK are:



The USA collaborates with the other S⁴ participating countries to form the NABK project team within the framework of the SG/2 Quality System:

Project Management

- Project Planning
- Project Monitoring and Control
- Risk Management

Engineering

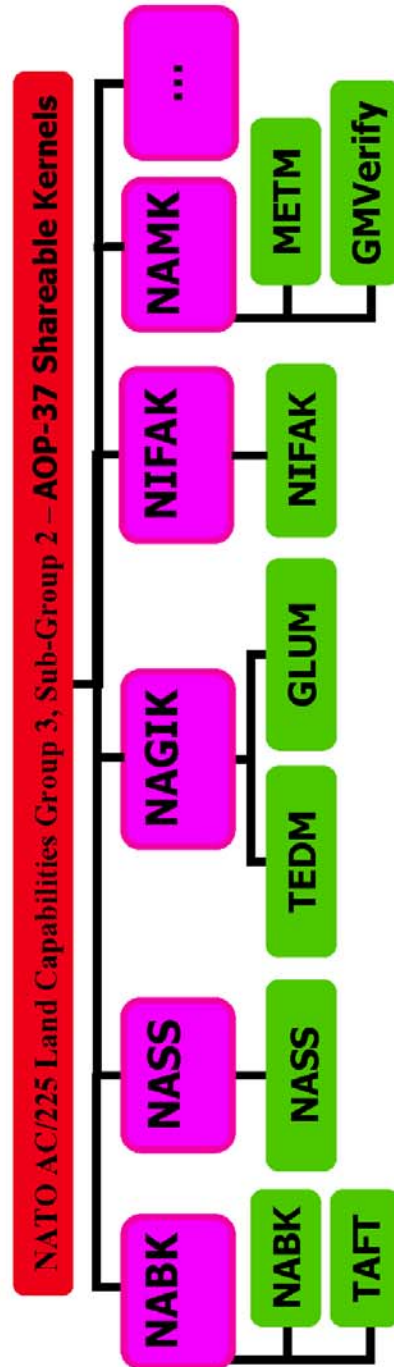
- Requirements Management
- Technology Development
- Software Development

Support

- Configuration Management
- Process Assurance
- Product Evaluation

The NABK project distributes a new release in February of each year.

The re-organisation of the shareable kernel products during late 2004 into a set of coherent co-operative projects under the AOP-37 programme endorsed by SG/2 brings clarity to a complex software system.



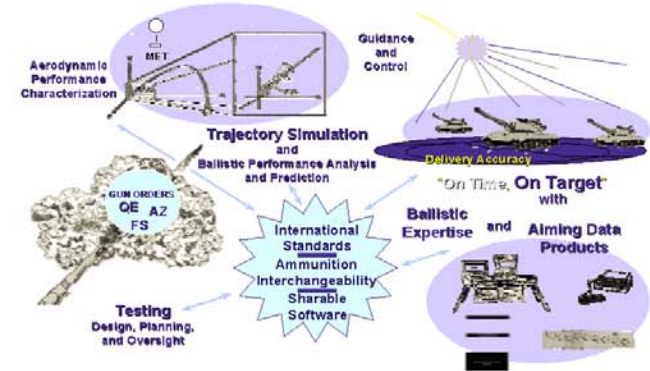
NASS - NATO Armaments Support Services – underpins all other Project layers with generic functions.
 NAGIK – NATO Armaments Geophysical & Information Kernel
 NAMK – NATO Armaments Meteorological Kernel – joint programme with BMSS to produce forecaster
 NIFAK – NATO Indirect Fire Appreciation Kernel – evaluates Weights of Fire & Distribution of Fire.



NATO Armaments Ballistic Kernel

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The NATO Armaments Ballistic Kernel (NABK) provides ballistics related functionality (trajectory simulation, computation of firing data, etc.) for use in technical fire control systems and laboratory applications within the **Ballistics Fire Control Domain**:



The NABK is developed under the auspices of NATO AC/225 Land Capability Group 3, Sub-Group 2, using controlling authorities from the AOP-37 and STANAG 4537. The NABK is part of a suite of shareable kernels that has been created to support the needs of applications within the fire support community.

For further information visit:

<https://www.aop-37.org>

Or email:

Nabk_pl@aop-37.org

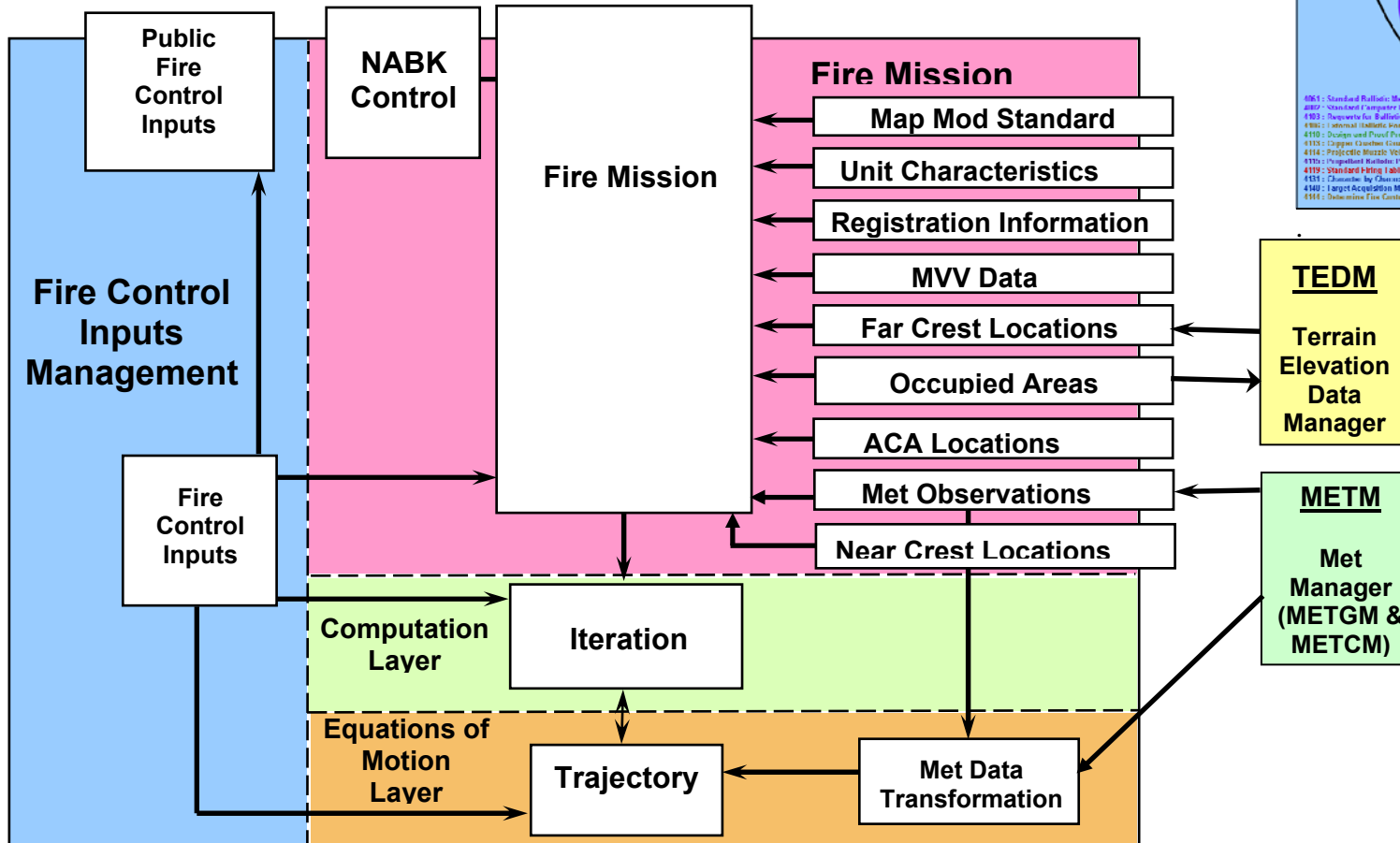
The NABK is written in the Ada programming language with code and processes conforming to the AOP-49 *SG/2 Quality System*.

The NABK currently supports Cannon Artillery (unassisted, rocket assisted, base-burn projectiles), Mortars, Tanks, Fighting Vehicles and Small Arms technical fire control applications and can also interface to external ballistics routines via *MS Windows DLLs*. Support for Rockets and GPS Guided projectiles will be completed in the near future.

The NABK is structured in discrete layers to aid functional separation and maintainability. The layers are Fire Mission (FMNL), Computation (CMPL) and Equations of Motion (EQML) with a common kernel and OPr facing functional “layer” known as the Fire Control Input Layer (FCIL).

A schematic architecture diagram is shown below recognizing that the Far Crest Databases can be handled by the Terrain Elevation Data Manager (TEDM) from the NAGIK project and the Met Manager (METM) from the NAMK project.

NABK Software Architecture



The NABK has dependencies on NASS, released in Sept of each year, NAGIK for TEDM (terrain cresting) and NAMK for the Met Manager (METM) for METGM data handling. NAGIK and NAMK are released in the November timeframe each year.

The foundation for the technology that is implemented within the NABK is recognized international standards and NATO Standardization Agreements (STANAGs):

