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NSA

13 May 2011 NSA(DI)0518(2011)JAIS/4554

See CNAD AC/225 STANAG distribution

STANAG 4554 JAIS (EDITION 2) – AVIATION MISSION PLANNING SYSTEM (AMPS)

References:
a. NSA/0862-LAND/4554 dated 4 September 2002 (Edition 1)
b. PFP(NAAG)D(2009)0022 dated 12 June 2009 (Edition 2)(Ratification Draft)

1. The enclosed NATO Standardization Agreement, which has been ratified by nations as reflected in the NATO Standardization Document Database (NSDD), is promulgated herewith.

2. The references listed above are to be destroyed in accordance with local document destruction procedures.

ACTION BY NATIONAL STAFFS

3. National staffs are requested to examine their ratification status of the STANAG and, if they have not already done so, advise the Defence Investment Division through their national delegation as appropriate of their intention regarding its ratification and implementation.

Cihangir AKSIT/TUR Civ
Director, NATO Standardization Agency

Enclosure:
STANAG 4554 (Edition 2)

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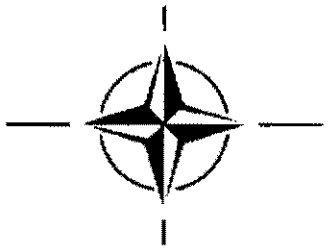
STANAG 4554
(Edition 2)

NORTH ATLANTIC TREATY ORGANIZATION
(NATO)



NATO STANDARDIZATION AGENCY
(NSA)

STANDARDIZATION AGREEMENT
(STANAG)

SUBJECT: AVIATION MISSION PLANNING SYSTEM

Promulgated on 13 May 2011

Cihangir AKSIT TUR Civ
Director, NATO Standardization Agency

STANAG 4554
(Edition 2)

RECORD OF AMENDMENTS

No.	Reference/Date of amendment	Date entered	Signature

EXPLANATORY NOTES

AGREEMENT

1. This STANAG is promulgated by the Director NATO Standardization Agency under the authority vested in him by the NATO Standardization Organisation Charter.

2. No departure may be made from the agreement without informing the tasking authority in the form of a reservation. Nations may propose changes at any time to the tasking authority where they will be processed in the same manner as the original agreement.

3. Ratifying nations have agreed that national orders, manuals and instructions implementing this STANAG will include a reference to the STANAG number for purposes of identification.

RATIFICATION, IMPLEMENTATION AND RESERVATIONS

4. Ratification, implementation and reservation details are available on request or through the NSAwebsites (internet http://nsa.nato.int; NATO Secure WAN http://nsa.hq.nato.int).

FEEDBACK

5. Any comments concerning this publication should be directed to NATO/NSA – Bvd Leopold III - 1110 Brussels - Belgium.

STANAG 4554
(Edition 2)

NATO STANDARDIZATION AGREEMENT (STANAG)

Aviation Mission Planning System (AMPS)

ANNEXES:

A. CONCEPT OF OPERATIONS
B. CAPABILITIES
C. KEY FEATURES

RELATED DOCUMENTS:

STANAG 2211 IGEO	GEODETIC DATUMS, PROJECTIONS, GRIDS AND GRID REFERENCES
STANAG 3838 AVS	DIGITAL TIME DIVISION COMMAND/RESPONSE MULTIPLEX DATA BUS
STANAG 5516 C3	TACTICAL DATA EXCHANGE – LINK 16
STANAG 5616 C3	STANDARDS FOR DATA FORWARDING BETWEEN TACTICAL DATA SYSTEMS EMPLOYING DIGITAL DATA LINK 11/11B AND TACTICAL DATA SYSTEMS EMPLOYING LINK 16
STANAG 7074 IGEO	DIGITAL GEOGRAPHIC INFORMATION EXCHANGE STANDARDS (DIGEST)
STANAG 7098 IGEO	COMPRESSED ARC DIGITIZED RASTER GRAPHICS (CADRG)

AIM:

1. The aim of this agreement is to specify the minimum standardization requirements of an Automated Mission Planning System (AMPS) for NATO battlefield helicopters.

AGREEMENT:

2. Participating nations agree that the Automated Mission Planning System (AMPS) for battlefield helicopters shall be as detailed herein.

DEFINITIONS:

3. BUSSED AIRCRAFT - An aircraft that is able to integrate data from numerous electronic systems, i.e., communication, navigation, threat identification, and fire control via a single mode transport.

DETAILS OF THE AGREEMENT:

4. System details, characteristics, and capabilities can be found at the Annex A.

IMPLEMENTATION AGREEMENT:

5. This STANAG is implemented when a nation has issued instructions that AMPS (as described in Annexes A to C) will be used as a mission-planning tool for battlefield helicopters, and procedures for acquisition and fielding are initiated.

ANNEX A to
STANAG 4554
(Edition 2)

AVIATION MISSION PLANNING SYSTEM

CONCEPT OF OPERATIONS

A. GROUND STATIONS

1. The aviation mission planning system is a computer and graphical user interface software based mission planning tool that automates mission planning tasks. Connected to higher level command and control systems as a subordinate system at the battalion, squadron, and brigade level, the aviation mission planning system is integrated to provide functionality which assists in improving battlefield synchronization/intelligence in the tactical command and control area. This integration connects computers via local area network (LAN) within the tactical operations center. This integration provides the ability to access, use, and share databases containing critical mission related information. At the company and flight level the aviation mission planning system is used in a stand-alone and/or networked fashion to generate mission applicable data for use in either hard copy format (kneecards) or electronic format for upload to aircraft mission computers via data transfer media. As such, the aviation mission planning system can greatly reduce the errors, time and workload currently associated with pre-mission planning and aircraft subsystems initialization tasks.

B. AIRCRAFT

1. Continued improvements to NATO aircraft warrant the use of an aviation mission planning system to transfer communication and flight data to the aircraft during start procedures via data transfer media. The aviation mission planning system's most critical role is in its ability to assist the aviator in preloading aircraft weapons, navigation subsystems, and communication radios. Preloading this information into the data transfer media allows the aviator to rapidly initiate the aircraft's subsystems instead of spending 30-45 minutes operating on an auxiliary power unit (APU) or main engine power while this data is otherwise entered manually. This information includes navigation waypoints and target locations (latitude/longitude or Universal Transverse Mercator (UTM) coordinates and elevation), communication and navigation radio presets, e.g., channels, frequencies, net lists, multiple words of day, call-signs, Global Air Traffic Management (GATM) information, map imagery and tactical data, e.g., weapons onboard, fusing data, laser codes, fire control radar targeting data, etc.

2. Second to the data loading function is the capability to automate the planning of the route, which is loaded into the aircraft. By displaying a digitized map, registering it with digital terrain elevation data (DTED), and allowing the soldier to plot his course on the screen and providing analysis tools (inter-visibility, performance planning, and weapons planning), the aviation mission planning system expedites the tedious tasks of pre-mission planning.

3. Once the aviation mission planning system pre-loads the data transfer media with data, the data transfer media is inserted into an aircraft receptacle for transfer to its data subsystem. In the case of bussed aircraft, this is done over the bus and under the control of an aircraft central computer. In the case of non-bussed aircraft with a single subsystem as the data target, e.g., an inertial navigation computer with waypoint data, the receptacle interfaces only with the subsystem.

4. The aviation mission planning system will have the capability of transferring messages to aircraft utilizing a communications media interfaced to a radio. When the aircraft platforms are able to support the capability, the aviation mission planning system could be used to transmit updates of mission route, threats, or whatever data is applicable to the aircraft in the mission execution phase.

5. The system will be in compliance with STANAG 3838.

C. DATA TRANSFER MEDIA

1. The aviation mission planning system provides several electronic media capabilities for data transfer. For input of map data, the aviation mission planning system uses standard digital map source disks.

2. For transfer of data to aircraft, the aviation mission planning system uses data transfer media currently dictated by the aircraft platform developers and their data needs, or it can pass information to the aircraft via other specified media. The developers maintain interface control documents (ICD), which specify memory addresses and in what specific word/byte/bit formats.

3. For over-the-air transmission between aviation mission planning systems, file transfer protocol (FTP) is used. Standard message protocols are used for over-the-air transmission between the aviation mission planning system and aircraft. The aviation mission planning system will have the capability to transmit over secure data communication means. The aviation mission planning system will transmit over LAN to other aviation mission planning systems which have their own internet protocol (IP). When the appropriate radio net is available the aviation mission planning system will be able to selectively route information via that system.

D. LOGISTICS MANAGEMENT SUPPORT (When Applicable)

1. Automated Flight Records Systems: Flight records information systems may be maintained in conjunction with aviation mission planning systems providing current pilot information for flight scheduling and risk analysis. Automated flight record systems provide real-time tracking of data, operating independently or in conjunction with aviation

mission planning systems in local or remote environments while maintaining home station connectivity. An automated flight record system augments split-based operations by providing connectivity to home station servers. Flight record data is accessible and transferable through the use of data transfer media from computer to computer. Automated flight record systems will be compatible with current fielded computing systems and not require computer augmentation. Automated flight records systems will collect and maintain information on Flight Personnel Hour Closeouts, Medical Flight Status, and Air Traffic Controller Training and Proficiency information. An automated flight records system supports the overall commander's Aircrew Training Program (ATP).

2. Aircraft Logistics - Unit aircraft data could include aircraft maintenance status, utilization hours, installed equipment, and unique configuration data. In addition to its use in determining which aircraft are available and configured for unique mission requirements, this data could be used for the purposes of accurate performance and weight and balance computations. This data could also be used for calculating mission risk assessments based on appropriate data, the threat expected to be encountered, and the onboard aircraft survivability equipment (ASE).

E. WEAPONS DELIVERY PLANNING

1. The aviation mission planning system allows the aviator to enter weapon specific fusing and guidance sensor data, e.g., laser codes. Through its inter-visibility tool, the aviation mission planning system allows the aviator to choose mission route points that are most advantageous to entering battle positions with the least amount of detection. Future aviation mission planning system functionality will incorporate auto-routing capabilities of the known threats and the aircraft's performance, signature, and ASE limitations.

ANNEX B to
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AVIATION MISSION PLANNING SYSTEM

CAPABILITIES

A. SITUATIONAL AWARENESS

1. The aviation mission planning system will provide the capability for the user to manage those symbols and control measures which are used to display the situation, plan a mission that can be loaded on the data transfer media for transfer to, and use aboard the aircraft. The basic symbol sets in order of precedence to be available for use shall be common warfighting symbology, NATO standardized operational terms and symbols, and those unique symbols defined in aircraft specific ICDs. The following paragraphs give examples of situation data tables that will generally be required.

2. Friendly Situation Data Table - The aviation mission planning system will allow the import or creation of data files and associated overlays to depict the friendly situation to include friendly force disposition and density. Basic elements of this overlay will include the position of adjacent, higher and lower forces, control measures and unit boundaries. This overlay must be presented in both graphical format and tabular format.

3. Threat Situation Data Table - The aviation mission planning system will allow the import or creation of the data files, which depict threat situation data overlays. Basic elements of this overlay will include the position of threat forces, threat force density data, threat command and support elements, likely threat courses of action, command and control (C2) components, and front line trace. This overlay shall be presented in either graphical or tabular format.

4. Threat Capability Data Table - The aviation mission planning system will allow the import or creation of the data files necessary to maintain a look-up table, which contains basic threat weapons and capabilities by type. Additionally, this information will be used by the masking function (threat masking plot/threat visibility limits) when determining line-of-sight calculations. This database will contain the information, which describes the capability of all weapon systems that are a potential threat to the crew and aircraft for which the plan is being developed no matter what the origin of the weapon system.

5. Additional Data Tables.

   a. The Fire Support Data Table will be used for depiction of the fire support plan to include the position of fire support, control lines, and pre-planned user entered target locations.

   b. The Logistics Data Table will be used for depiction of the logistics support plan to include logistics support centers and maintenance and logistics thresholds for battlefield support.

c. The Weather Data Table will contain data to be used to display both graphical and tabular information from weather reporting systems and standard oceanographic and weather data formats.

d. The Flight Hazards Data Table will contain data used to depict the hazards to flight.

6. Having received the mission via the operations order and defined the data as outlined above, the aviator is able to plot his route in consideration of the friendly situation, threat, target situations, and hazards. Thus, the aviation mission planning system provides a capability to maximize the use of available information in order to make well-informed decisions.

B. IN-FLIGHT INFORMATION

1. The aviation mission planning system has the capability to use a ground-based radio to allow aviation mission planning systems to communicate with properly equipped aircraft or other aviation mission planning systems located at battalion or brigade tactical operations centers via communications radio. This capability allows the aircraft to transmit mission and location data to the aviation mission planning system on the ground. The aviation mission planning system can format and display the received information. With this feature, the Aviation commander may use the aviation mission planning system to dynamically command and control forces during mission execution. The following are minimal intelligence and/or command information requirements for data to be transferable between aviation mission planning system and aircraft: Battle Damage Assessments (BDA), call for fire/close air support, free-text messages, target arrays, threat arrays, shot at files, situation reports, and spot reports.

C. AVIATION MISSION PLANNING TASKS

1. The aviation mission planning system provides the aviator with the capability to plan a mission of equal complexity, yet with greater accuracy than current manual practices, in equal or faster time. This capability includes the route plotting in consideration of terrain and obstacles to flight, calculations of weight and balance, aircraft performance conditions at all required points of the route, and communications planning to include assignment of frequencies, call-signs, net IDs, etc., for voice and radio navigation aids. This data will be rapidly loaded into the aircraft via the data transfer media, completing the automation of mission planning tasks.

2. The aviation mission planning system will provide the capability for the commander of a mission to assign to the members of his team necessary tasks to complete the planning session. As the commander lays out proposed routes, the aviation

mission planning system will provide guidance as to the feasibility of the routes based on the capability limits of the designated aircraft on those routes. The possibility exists that flight formations may consist of different types and models of aircraft, therefore, the constraints for that route, i.e., estimated time of arrival to target, will be based on the aircraft with the most restrictive limits. All meteorological restrictions and aircraft performance limitations, e.g., aircraft speed, range, endurance, and ability to hover in and out of ground effect, will be taken into account.

D. INTEROPERABILITY

1. The aviation mission planning system has to be interoperable to the maximum extent possible with other services and allied mission planning systems. A major capability required to support standardization, to at least the interoperability level, is the sharing of data with other users, platforms and military services. Therefore, the aviation mission planning system provides the capability to format, read, interpret, and display data/files via the requisite data standard formats or by automatic interfacing media. The aim is to achieve direct data exchange links to provide near real time capability in accordance with STANAG 5516 and 5616.

ANNEX C to
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AVIATION MISSION PLANNING SYSTEM

KEY FEATURES

A. HARDWARE & SOFTWARE

1. The aviation mission planning system is designed to support brigade, battalion, squadron, and company level mission planning operations, and consists of different hardware configurations. The basic system functionality is the same across all command levels, but the peripheral equipment is fielded to the appropriate user level. The system must be capable of using either commercial and/or military specific software. The minimum and recommended commercial hardware requirements are as follows.

	Basic Mission Planning	
	Minimum	**Recommended**
Processor	Pentium III or equivalent	Pentium IV equivalent or better
RAM	1GB	2GB
Hard Drive Free Space	10GB	80GB
CD ROM	DVD-R/CD-RW	DVD+-R/RW
Monitor Resolution	1024x768 16 bit color (High Color), (65,536 colors)	1280x1024 32 bit color (True color)
Printer	Windows Compatible	600 dpi 128MB RAM
Video Card	32 MB Open GL	128MB Open GL
Cartridge Device	Compatible with A/W/E	Compatible with A/W/E
Operating System	Windows XP with service pack 2	Windows XP Pro with service pack 3

B. TACTICAL MISSION PLANNING

1. Aviation mission planning tasks will include the functions of data management necessary for input, edit, storage, and output of all system tactical data between the aviation mission planning system, the aircraft, and mission support functions/subsystems. The user will be able to use the aviation mission planning system to manually input/update either tactical data or meteorological data which has been imported from other systems via the external interfaces. This data will then be transferred to the aircraft via loading on the data transfer media in accordance with the respective ICD. Examples of tactical data to be loaded by the aviation mission planning system are laser codes, order of battle, and target locations.

C. PERFORMANCE PLANNING AND WEIGHT AND BALANCE (W&B) COMPUTATIONS

1. The aviation mission planning system will provide the capability for the user to select, view, edit/update and save the latest current aircraft configuration and limitation data from the tail number unique unit aircraft database prior to a mission. The exact permissible configurations are specified in the respective aircraft operators' manuals and will serve as the baseline data to which mission specific loads are added for W&B calculations. Objectively, an interactive graphical depiction of the aircraft showing the possible loading points and typical loads, and which allows drag and drop load computation will be provided along with look-up table libraries containing the weights and sizes of all items certified for transport by the type of aircraft. The aviation mission planning system will provide the capability to modify the aircraft configuration, including fuel, weapons, weapons/stores racks/pylons, internal/external cargo, crew, passengers, crew equipment, and mission equipment, and calculate the net effects of these changes on aircraft basic weight, basic moment, and any corresponding drag changes.

2. The aviation mission planning system will provide the capability to make predictive aircraft performance calculations for the departure, en-route and landing phases of the flight.

3. The aviation mission planning system will integrate the performance characteristics of each aircraft for use in performance planning calculations utilizing the substantiation data (aircraft coefficient data) provided by the appropriate agency. This data includes aerodynamic effects due to drag based on the aircraft operating conditions and mission stores configuration. It also includes propulsion system performance effects due to engine torque factors (ETFs) and environmental operating conditions defined during route planning.

D. AVIATION SIGNAL OPERATING INSTRUCTIONS (SOI)

1. The aviation mission planning system assists in the automation of two distinct phases of mission communications planning. The first phase consists of creating the generic communications plan. The second phase consists of assembling the aircraft specific communications data required for upload to the data transfer media and aircraft. The aviation mission planning system will provide the user the capability to develop the necessary items required for the respective aircraft by extracting information in the communications plan. The aviation mission planning system will allow the user to manage SOI data and/or enter or adjust SOI aircraft data communications information. This information consists of preset radio settings and frequencies in all communications and identification systems call-signs, suffixes, expanders, type of nets, signs and countersigns. As a minimum, the aviation mission planning system shall be able to store multiple editions of tactical communications database files and load to the data transfer media for aircraft initiation.

2. The aviation mission planning system will provide the capability for the user to load, in a fully automated fashion, data from the appropriate source and then select, edit, delete, and save SOI data into a communications database. The aviation mission planning system will also provide the capability for the user to manually input data from a paper SOI to create a communications database.

E. HARDCOPY OUTPUTS

1. The aviation mission planning system will provide the capability for the user to view and print user required knee-boards such as authentication matrix, crew card, communications net card, communications preset card, Performance Planning Card (PPC), Time Distance Heading (TDH) card, and waypoint/target list.

2. Other hardcopy products will include maps, photographic/satellite imagery of landmarks or targets, orders, forms and annexes such as: fragmentary orders, operations orders, warning orders, flight plan forms, weight and balance clearance forms, flight authorization forms, weather briefings, post mission reports, and logistics annexes.

F. MAP SOURCES AND PRODUCTS

1. The aviation mission planning system will use standard mapping products according to NATO STANAG 7074 and 7098 for digital geodetic data as a source for digitized paper maps, digital terrain elevation data, and other geodetic data. The aviation mission planning system will provide the capability for the user to load these map products and then create, store, and display a seamless area of interest (AOI).

2. The aviation mission planning system will provide the capability for the user to employ map scales from 1:5 million to 1:50,000. The aviation mission planning system will provide the capability to concurrently maintain map information for the AOI in tactical and joint operation map scale. The aviation mission planning system will register this map data with DTED. Utilizing the DTED, the aviation mission planning system will provide the capability to slope-shade a DTED map and display contour lines on the map displayed in the map window.

3. The aviation mission planning system will allow the user to select and utilize either standard, or user specified datum or grid coordinate systems for mapping functions. The aviation mission planning system will maintain a look-up table, which provides spheroid data necessary for position and navigational computations and conversions between differing reference datum.

4. Additional special map display features which the aviation mission planning system include are map scrolling, moon shadowing, entry of positional data from digital

map - in accordance with STANAG 2211 (geodetic datum, ellipsoids, grids, and grid references), display of information available icons, declutter icons, and imagery overlay.

5. The aviation mission planning system will provide the capability to load, create, edit, view, and save data files used to display graphical overlays consisting of symbology features for specific military terms and graphics which may be either mission dependent or mission independent. This overlay symbology data includes threat, friendly situation, hazards, route, and Airspace Coordination Orders (ACO).

G. PREVIEW/REHEARSAL CAPABILITIES

1. The aviation mission planning system will provide the capability to perform fly through of the planned mission route in 3D depiction at real or near real-time speeds to include visualization of the flight path and terrain from both the cockpit perspective and from the perspective of onboard vision systems. The aviation mission planning system shall have the capability to indicate the viewing position and the direction of the perspective view upon the 2D map. Additional detailed requirements of this capability include display of command and control graphical and iconic overlays including masking, detection and engagement envelopes, terrain slope shading, terrain elevation shading, terrain contour lines, terrain sun-shadowing, terrain moon illumination, and graphical results of intervisibility calculations.