



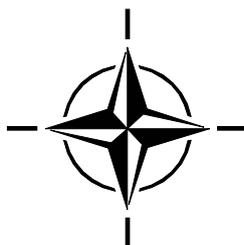
RTO TECHNICAL MEMORANDUM

TM-SPD-001

2004 Space Report: Environment and Strategy for Space Research at NATO's Research and Technology Organisation (RTO)

(Compte rendu Espace 2004 : Environnement et stratégie
de la recherche spatiale de l'Organisation pour
la recherche et la technologie de l'OTAN)

Prepared by the RTA Strategy and Planning Division.



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by

Jessica A. Woods-Vedeler

The Research and Technology Organisation (RTO) of NATO

RTO is the single focus in NATO for Defence Research and Technology activities. Its mission is to conduct and promote co-operative research and information exchange. The objective is to support the development and effective use of national defence research and technology and to meet the military needs of the Alliance, to maintain a technological lead, and to provide advice to NATO and national decision makers. The RTO performs its mission with the support of an extensive network of national experts. It also ensures effective co-ordination with other NATO bodies involved in R&T activities.

RTO reports both to the Military Committee of NATO and to the Conference of National Armament Directors. It comprises a Research and Technology Board (RTB) as the highest level of national representation and the Research and Technology Agency (RTA), a dedicated staff with its headquarters in Neuilly, near Paris, France. In order to facilitate contacts with the military users and other NATO activities, a small part of the RTA staff is located in NATO Headquarters in Brussels. The Brussels staff also co-ordinates RTO's co-operation with nations in Middle and Eastern Europe, to which RTO attaches particular importance especially as working together in the field of research is one of the more promising areas of co-operation.

The total spectrum of R&T activities is covered by the following 7 bodies:

- AVT Applied Vehicle Technology Panel
- HFM Human Factors and Medicine Panel
- IST Information Systems Technology Panel
- NMSG NATO Modelling and Simulation Group
- SAS System Analysis and Studies Panel
- SCI Systems Concepts and Integration Panel
- SET Sensors and Electronics Technology Panel

These bodies are made up of national representatives as well as generally recognised 'world class' scientists. They also provide a communication link to military users and other NATO bodies. RTO's scientific and technological work is carried out by Technical Teams, created for specific activities and with a specific duration. Such Technical Teams can organise workshops, symposia, field trials, lecture series and training courses. An important function of these Technical Teams is to ensure the continuity of the expert networks.

RTO builds upon earlier co-operation in defence research and technology as set-up under the Advisory Group for Aerospace Research and Development (AGARD) and the Defence Research Group (DRG). AGARD and the DRG share common roots in that they were both established at the initiative of Dr Theodore von Kármán, a leading aerospace scientist, who early on recognised the importance of scientific support for the Allied Armed Forces. RTO is capitalising on these common roots in order to provide the Alliance and the NATO nations with a strong scientific and technological basis that will guarantee a solid base for the future.

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List of Acronyms

ACT	Allied Command Transformation
AG	Activities Group
AGARD	Advisory Group for Aerospace Research and Development
AGS&R	Aerospace Ground Surveillance and Reconnaissance
ASAR	Advanced Synthetic Aperture Radar
ASAT	Anti-Satellite
ATI	Automatic Target Identification
AVT	Applied Vehicle Technology
CAESAR	Coalition Aerial Surveillance and Reconnaissance
CCMS	Committee on the Challenges of Modern Society
CFSP	Common Foreign and Security Policy
CSD	Coalition Shared Database
DoD	Department of Defense
DRG	Defense Research Group
EC	European Commission
EHF	Extremely High Frequency
EMP	Electro-Magnetic Pulse
ENVISAT	Environment Satellite
EO	Executive Officer
ERS	European Remote Sensing
ES	Executive Session
ESA	European Space Agency
ESDP	European Security and Defense Policy
ESM	Electronic Support Measures
ESRP	European Space Research Program
EU	European Union
GLONASS	Global Navigation Satellite System
GMES	Global Monitoring for Environment and Security
GMTI	Ground Moving Target Indicator
GPS	Global Positioning System
HFM	Human Factors and Medicine
IMU	Inertial Measurement Units
IPM	Inter-Panel Meeting
ISAF	International Security Assistance Force
ISAR	Inverse Synthetic Aperture Radar
IST	Information Systems Technology
ISTAR	Intelligence, Surveillance, Target Acquisition and Reconnaissance
Kbps	Kilobits/second

LADAR	Laser Radar
LANDSAT	Land Satellite
LEO	Low-Earth Orbit
LIDAR	Laser Imaging Detection and Ranging
M&S	Modeling and Simulation
MAJIC	Multi-Sensor Aerospace-Ground Joint Interoperable Intelligence Surveillance and Reconnaissance Coalition
MAS	Mission Application Study
MC	Military Committee
MEM	Micro-Electro-Mechanical
MEO	Mid-Earth Orbit
MERIS	Medium Resolution Imaging Spectrometer
MMW	Millimeter Wave
MTI	Moving Target Identification
NAC	North Atlantic Council
NASA	National Aeronautics and Space Administration
NATO	North Atlantic Treaty Organization
NAVWAR	Navigational Warfare
NC3A	NATO Consultation, Command and Control Agency
NC3B	NATO Consultation, Command and Control Board
NCTI	Non-Cooperative Target Identification
NCW	Network Centric Warfare
NEC	Network Enabled Capability
NMSG	NATO Modeling and Simulation Group
NURC	NATO Underwater Research Center
OA	Operational Analysis
OS	Open Service
PASR	Preparatory Action in the field of Security Research
PNT	Position, Navigation and Timing
PBM	Panel Business Meeting
PRS	Public Regulated Service
R&T	Research & Technology
RADARSAT	Radar Satellite
REA	Rapid Environmental Assessment
RF	Radio Frequency
RNSS	Radio Navigation Satellite Service
RSG	
RTA	Research and Technology Agency
RTB	Research and Technology Board
RTO	Research and Technology Organization
SAG	Space Advisory Group
SAR	Synthetic Aperture Radar

SAS	Studies, Analysis and Simulation
SATCOM	Satellite Communication
SCI	Systems Concepts and Integration
SDR	Software Defined Radios
SEC	Space Expert Consultants
SET	Sensors & Electronics Technology
SHF	Super High Frequency
SPD	Strategic and Policy Division
SPS	Strategic Planning Session
SRTM	Shuttle Radar Topography Mission
TG	Task Group
UAV	Unmanned Aerial Vehicles
UAV	Unmanned Autonomous Vehicles
UHF	Ultra High Frequency
US	United States
VNC	Voluntary National Contribution
WG	Working Group

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14. Abstract	<p>This report describes the motivation for and a strategy to enhance the NATO Research and Technology Organisation's (RTO) current space research effort to reflect NATO's growing military dependence on space systems. Such systems and services provided by these systems are critical elements of military operations. NATO uses space systems for operational planning and support, communication, radio navigation, multi-sensor and multi-domain demonstrations. Such systems are also used to promote regional stability. A quantitative analysis of work related to space in the NATO RTO showed that during the period of 1998 – 2004, 5% of the research pursued in the NATO RTO has been clearly focused on space applications. Challenging environmental and organizational barriers for increasing RTO space research were identified. In part, these include lack of sufficient space expertise representation on panels, the military sensitivity of space, current panel work loads and the need for specific technical recommendations from peers. A strategy for enhancing space research in the RTO is to create a limited-life Space Advisory Group (SAG) composed of Space Expert Consultants who are panel members with appropriate expertise and additional expertise from the nations. The SAG will recommend and find support in the nations for specific technical activities related to space in the areas of Space Science, Remote Sensing Data Analysis, Spacecraft Systems, Surveillance and Early Warning, Training and Simulation and Policy. An RTO Space Advisory Group will provide an organizational mechanism to gain recognition of RTO as a forum for trans-Atlantic defence space research and to enhance space research activities.</p>																																												





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