Locating M&S Information

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One of the remarkable things I notice when I go to Modelling & Simulation (M&S) forums such as this one is when three-quarters of the room is silent and the remaining quarter doing all the talking already knows most of the answers anyway. Although the retention of vast corporate knowledge is certainly a plus in our community, it does not bode well for our future when the walls we place between ourselves and key leaders are self-imposed. The purpose of this lecture is to encourage the three-quarters to meet the few of us halfway by gaining a measure of self-confidence through a professional M&S reading programme.

Most of those present are not here because of a keen desire to programme; although a few can. These lecture series are conducted to empower the implementer. If you are here to gather information in support of a senior General and are unable to articulate the M&S worldview, we are doing you and ourselves a disservice. That is why I have compiled a very innocent list of answers to common questions and included the supported websites so you can have your own on-line M&S library. Whether we realize or not, those of you looking for an answer need something more instantaneous than reading an entire book. What I have done is by no means exclusive to the selection placed in your hands, but it is indeed a start.

The idea is not to embarrass anyone but you would be surprised how long some of us have been around M&S and do not know the role and purpose of the NATO Research and Technology Office (RTO) or the NATO Modelling and Simulation Group (NMSG). Web links and search engines aside, here is where you will find the vision of a gentleman that served the NMSG for many years and just recently retired, Mr. Graham Burrows. Also there is a plethora of publications that may affect your M&S dilemma or enquiry which is why I will encircle the location of the search windows. Aside from the documents available in NATO RTO’s repository, particular attention should also be directed at the NATO Consultation, Command and Control Agency or NC3A for short. Aside from publications, many lectures, working group meetings and conferences relating to M&S occurs at the NC3A office at The Hague.

One of the initiatives that originated from the US was the Modelling and Simulation Resource Repositories of MSRRs of which we boast quite a few. We have the Modelling and Simulation Information and Analysis Center (MSIAC), the Defense Modelling and Simulation Office (DMSO), the Army MSRR which is sponsored by my organisation: the Battle Command, Simulation & Experimentation Directorate, along with MSRRs for the Air Force and Navy.

Report Documentation Page

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Let us say that a week from now, you followed my advice and downloaded a document from one of the NATO sites. One of the discoveries that you will make is that there is a fair amount of technical terms that many take for granted. Normally academic papers can be laden with ‘technical jargon’ but this is an impediment that can be overcome. The Defense Modelling and Simulation site has a glossary where most if not all of the words can be queried successfully.

One of the best kept secrets in this field is that few things anymore are ‘discovered’ in the truest sense of the word. That is why professional developers in M&S share their findings in public forums. The best known is the Simulation Interoperability Standards Organization (SISO). Not only does it cut a worldwide swath, it also conducts regional forums for professionals. M&S is not exclusive to defence or even government organisations; the confluence also includes academia and corporations.

The most important reason I included environmental modelling in compiling your list of web resources is due to the experience we had of late. Traditionally, along the South-eastern U.S. coastline, we receive horrendous weather that devastates entire parcels of villages. Also, the Asian Tsunami caught all of us completely off-guard. It is just as wise for the U.S. to prepare for hurricanes as it would be for Turkey to research earthquakes or Germany extreme flooding. While there is not enough time to include all possible sites of interest, the Master Environment Library (MEL) is a decent start.

For those of you concerned about modelling domestic resilience or counterterrorism, I recommend the Defence Science & Technology Laboratory (DSTL). Not only does the United Kingdom have a legacy in fighting terrorism but all of its national efforts are consolidated at DSTL. DSTL is the largest employer of scientists and engineers in that country, meaning that in addition to numerous synergies the information is easier to access than the ‘stove-piping’ still occurring within the US.

The reason I consider the Swedish Defence Wargaming Centre as an M&S centre of excellence is their depth of experience in Crisis Response Operations (CRO). Not only do they have a wealth of experience working with NATO, Partnership for Peace ( PfP) and neutral countries but they incorporate IOs and NGOs very well. I know of no other wargaming centre that welcomes and incorporates peace organisations at their exercises.

The oldest and one-time largest wargaming centre in the world is undergoing transition, however the two assets the Warrior Preparation Center (WPC) has that no one else does is a long legacy of Army-Air Force integration and Mission Rehearsal Exercises (MREs). The WPC, based in Ramstein always had its Grafenwoehr Germany location as a satellite, however the roles are expected to completely reverse by next year.

Another great centre is in Northern Germany at Sennelager. The facility is a wonderful mix of simulations, simulators and manoeuvre area. Ran by the United Kingdom’s Ace Rapid Reaction Corps or ARRC, this is arguably the best integrated exercise facility. When soldiers from the 3d UK Division cross the channel to come to Sennelager, the compilation of the 1st and 3d Divisions with the ARRC Headquarters makes this the premier location to train with UK forces.

Other centres are newer and deserve mention. NATO finally has a dedicated facility at JHQNE in Stavanger, Norway. Turkey and Poland have new facilities not to mention fully dedicated M&S professionals. The German simulation centre at Wildflecken is not only centrally located in Europe but able to handle thousands of visitors. No doubt there are others that deserve mention but when looking at public documents available on the web, certain niche specialties stand out. No one place or organisation has absolute advantage over the others, offering no viable alternative to research.
Sometimes, having access to web pages, documents and professional forums are not enough. The best way to propel a country’s M&S programme is to recognise the need for a dedicated officer to represent the national M&S efforts. To do this, I strongly recommend the Royal College of Military Science (RMCS) at Shrivenham, UK. The staff college is Joint and the faculty is first-rate with the security side taught by Kings College, University of London and the M&S side taught by the University of Cranfield. This also bodes well for officers that intend to continue towards a research PhD either full or part-time. The military library is nothing short of incredible and nearby at Oxford is one of seven national trust libraries in Great Britain containing every single volume ever published in that country. It is close to Heathrow and a little further to Stanstead where Ryan Air averages 10 euros or less to any destination in Europe.

Although this was never intended to be an all-source compendium of M&S information, this certainly qualifies as a start. This is a field where confidence begins with a few distinct steps. You have the background; you have the goals. There is also a lexicon and interoperability standards already figured out. Whether you need to model the environmental clash with nature or weathering human nature, there is a place to go. Speaking of a place to go, there are many legacy simulation facilities with new ones being added – no one has a monopoly over the panoply of military activities or how it’s modelled. Finally, as an enabler of your respective national effort, the best investment you can make is to identify a gifted officer worthy of the long-term investment of education.
Looking up M&S Information

Mr. Daniel Little
Battle Command, Simulation & Experimentation
Directorate (BCSE)
Learning Objectives

Develop a professional M&S research library using available web resources.

- NATO Research & Technology Organisation (RTO)
- NATO Modelling & Simulation Group (NMSG)
- NATO Consultation, Command & Control Agency (NC3A)
- Simulation Interoperability Standards Organization (SISO)
- Defence Science & Technology Laboratory (DSTL)
- Defense Modelling & Simulation Office (DMSO)
- US Modelling & Simulation Resource Repository (MSRR):
  - Army
  - Navy
  - Air Force
  - Master Environment Library (MEL)
- Swedish Defence Wargaming Centre (SDWC)
- Royal Military College of Science, Shrivenham, UK (RMCS)
Knowing the Answers
Before You Ask

What is the role and purpose of NATO RTO & NMSG?
What publications are available from NATO?
What publications are available from the US?
Where can I find an on-line glossary for M&S terms?
What are the international standards in M&S?
How does one model the environment?
Who do I talk to about modelling Domestic Resilience?
Where are the simulation centres of excellence?
Where can I send my country representative for a postgraduate M&S degree?
What is the role and purpose of NATO RTO & NMSG?

NATO Modelling and Simulation Group (NMSG)

Mission

The Mission of the NATO Modelling and Simulation Group (NMSG) is to provide readily available, flexible and cost-effective means to dramatically enhance NATO operations in the application areas of defence planning, operational planning, training and exercises, support to operations and modernization. This goal will be accomplished by a NATO-wide co-operative effort that promotes interoperability, reuse and affordability.

The mission of the NATO Modelling and Simulation (M&S) Group (NMSG) is to promote co-operation among Alliance bodies, NATO Member Nations and PfP Nations to maximise the effective utilisation of M&S according to the NATO M&S Action Plan. Primary mission areas include M&S standardisation, education, and associated science and technology. Additionally, the Group will provide M&S expertise in support of the tasks and projects within the RTB and from other NATO organisations.

- Download the NATO/PFP Distributed Simulation Report
- Download the NATO’s New Organisation and M&S Presentation

Scope

The Group:

a. Is responsible for the development and execution of, and proposing revisions to the NATO M&S Action & Business Plans.
b. Is a level-2 body of which its most important actions are enabling M&S and promoting best practices in the Alliance.
c. Develops, advocates and guides implementation of M&S standards.
d. Fosters maximum levels of M&S interoperability and reuse of models.
e. Develops, advocates and guides programs to facilitate education and information exchange in M&S science and technology, application methods and standards.
f. Identifies, advocates and executes science and technology projects to improve M&S tools, standards, interoperability, network concepts and databases.
g. As required, provides M&S expertise to support national efforts of the DTOs.
NATO's New Organisation and its Impact on Modelling and Simulation Activities

ITEC 2004 Conference
London, 20 to 22 April 2004
by
G J Burrows
burrowsg@rta.nato.int
What Publications are Available from NATO?

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g. As required, provides M&S support to support national pursuits of the DTO Panels.
<table>
<thead>
<tr>
<th>Activity</th>
<th>Reference</th>
<th>Title</th>
<th>Published</th>
<th>Download</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSG-028</td>
<td>RTO-MP-MSG-028</td>
<td>Modelling and Simulation to Address NATO’s New and Existing Military Requirements</td>
<td>Oct 2004</td>
<td></td>
</tr>
<tr>
<td>MSG-006</td>
<td>RTO-TR-MSG-006</td>
<td>M&amp;S Support to Assessments of Extended Air Defence C2 Interoperability</td>
<td>May 2004</td>
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<td>MSG-005</td>
<td>RTO-TR-MSG-005</td>
<td>Federation Development and Execution Process (FEDEP) Support Tools</td>
<td>May 2004</td>
<td></td>
</tr>
<tr>
<td>MSG-022</td>
<td>RTO-MP-MSG-022</td>
<td>C3I and Modelling and Simulation (M&amp;S) Interoperability</td>
<td>Mar 2004</td>
<td></td>
</tr>
<tr>
<td>MSG-002</td>
<td>RTO-TR-065</td>
<td>M&amp;S Support from PATHFINDER Programmes to Bi-SC Staff Training and Exercises Capabilities</td>
<td>Oct 2003</td>
<td></td>
</tr>
<tr>
<td>MSG-012</td>
<td>RTO-TR-051</td>
<td>Recommendations on the Establishment of a NATO Modelling and Simulation System</td>
<td>Apr 2003</td>
<td></td>
</tr>
</tbody>
</table>
What Publications are Available from NATO?

Welcome to the NATO Consultation, Command and Control Agency (NC3A)

Leader of NATO C3 Capabilities
The NATO C3 Agency is developing, procuring and implementing state of the art C3 capabilities for NATO and it is providing unbiased scientific advice and support to NATO authorities.
The NATO C3 Agency is an integrated team of more than 500 professionals, civilian and military, from NATO member nations dedicated to provide to NATO high quality expertise in the domain of Consultation, Command and Control. More...

NC3A Brussels
Bâtiment Z, 140 Avenue du Bourget, B-1110 Brussels, Belgium (Visitors)
Boulevard Leopold III, B-1110 Brussels, Belgium (Mail)
Telephone +32 (0)2 7074111, Fax +32 (0)2 7078770
A route description is available

NC3A The Hague
What Publications are Available from NATO?

Links

NATO Links

- NATO
- NATO Research and Technology Agency (RTA)
- NATO Maintenance and Supply Agency (NAMSA)
- Supreme Headquarters Allied Power Europe (SHAPE)
- Allied Command Transformation (ACT)
- SACLANT Undersea Research Centre (SACLANTCEN)

Other Links

- Defence Science and Technology Laboratory (DSTL)
- Defense Technical Information Center (DTIC)
- TNO Physics and Electronics Laboratory (TNO FEL)
What Publications are Available from the US?

To submit a URL to be added to this list, send an e-mail to links@msiac.dmsa.mil

**Key M&S Sites:**

- **DMSO**
  Defense Modeling and Simulation Office.
- **HLA**
  DoD High Level Architecture.
- **MSRR**
  Modeling & Simulation Resource Repository. A collection of resources which will assist the M&S community in communication and information sharing.
- **DoD M&S Education Initiative**
  Site includes information on DMSO's Modeling & Simulation Staff Officer's Course.
What Publications are Available from the US?

The MSRR, comprised of seven nodes, provides simultaneous retrieval of Modeling and Simulation resources. Providers include, this DMSO system, Army, Navy, Air Force, Missile Defense Agency, DIA, C4ISR Decision Support Center Information System & MSRR. Sponsored by DMSO, and operated by the Modeling and Simulation Information Analysis Center (MSIAC), the resources can be sorted and delivered electronically as specified by the user. Additional information may be obtained by calling the MSIAC Help Desk 703-933-3323/24 or 888-566-7672.

Need more info? Visit the MSIAC's MSRR Special Interest Area.

All web pages contained within the DMSO Web site are accessible to people using assistive technology. However, this site does contain historical files which may be difficult to access with assistive technology. Please contact the msiachelpdesk@msiac.dmsomil and our staff can provide you the information in an alternate, accessible format upon your request. For more information on Section 508 and the Federal IT Accessibility Initiative, please visit the Center for IT Accommodation (CITA) or the Section 508 Homepage.
What Publications are Available from the US?

The Army MSRR is part of the DoD-wide Modeling & Simulation Resource Repository (MSRR). The MSRR promotes interoperability, reuse, and commonality through information sharing and communication throughout the M&S community. A large number of organizations and a significant degree of effort are involved throughout the US Army in leveraging M&S technologies for the execution of Title 10 responsibilities. This site is intended as a guide and directory to Internet information on these activities. Users can locate, access, and obtain M&S resources that support Training, Exercises, & Military Operations (TEM0); Advanced Concepts and Requirements (ACR); and Research, Development, and Acquisition (RDA).

The Battle Command, Simulation, and Experimentation (BCSE) Directorate hosts the Army MSRR.

BCSE has formed an Army MSRR Working Group (approved by the AMSEC). See Army MSRR WG for additional information.
What Publications are Available from the US?

- Air Force Modeling and Simulation Repository
- Navy Modeling and Simulation Catalog
- DMSO Modeling & Simulation Repository
- Master Environmental Library (MEL)
- Joint C4ISR Decision Support Center

For system problems or questions, contact the Army MSRR Web Administrator.
Where can I Find an On-line Glossary for M&S Terms?

Online M&S Glossary (DoD 5000.59-M)

Using the online glossary:

- The results of any search will display acronyms followed by all terms.
- If you place only 1 letter in the search field, all acronyms and terms that start with that letter will be displayed.
- If you place more than 1 letter in the search field, all acronyms and terms that contain those letters will be displayed.
- You may specify how to search on the text you place in the search field, (starts with, contains, or within definition) by making a selection to the right of the search field.
- Within results for terms, you may find "see also" and "contrast with" links. These links will take you...
What are the International Standards in M&S?

The Product Development Activity of SISO seeks to provide an environment for the development of products to support the interoperability and reuse of distributed simulations. Learn more about the Standards Activity Committee - the committee that oversees the development of SISO Products.

- **SISO Standards**
  - **SISO-STD-007.1-1999**: (RPR FOM 1.0)
  - **SISO-STD-001-1999**: (GRIM 1.0)
What are the International Standards in M&S?

Welcome to the Simulation Interoperability Standards Organization's (SISO) *Brand New* home on the web.

Dedicated to facilitating simulation interoperability across a wide spectrum, SISO provides forums, educates the M&S community on implementation, and supports standards development.

SISO is also proud to host several M&S Conferences including the: Simulation Interoperability Workshop, European SIW, and the Behavior Representation in Modeling and Simulation.
What are the International Standards in M&S?

2005 EURO SIW

The 2005 Euro SIW is an event encompassing a broad range of model and simulation issues, applications and communities. It will consist of tutorials on the state-of-the-art methodologies, tools and techniques; topical survey sessions as well as a series of forums addressing interoperability issues and proposed solutions.
How Does One Model the Environment?

- Air Force Modeling and Simulation Repository
- Navy Modeling and Simulation Catalog
- DMSO Modeling & Simulation Repository
- **Master Environmental Library (MEL)**
- Joint C4ISR Decision Support Center

For system problems or questions, contact the Army MSRR Web Administrator.
The Master Environmental Library (MEL) is a Defense Modeling and Simulation Office (DMSO) sponsored, one-stop site for ordering environmental information. Through MEL, users locate and order environmental information that resides at different United States military and government sites.
How Do I Talk to About Modelling Domestic Resilience?
How Do I Talk to About Modelling Domestic Resilience?

Capabilities

Dstl is composed of many specialist teams each of which is expert in its particular technology or facility. These teams encompass defence research, analytical studies, test and evaluation of operational equipment and research into human effectiveness and protection.

In addition to our military customers, we also work closely with government and industrial laboratories in the United States and Europe.
How Do I Talk to About Modelling Domestic Resilience?
Where are the Simulation Centres of Excellence?
Where are the Simulation Centres of Excellence?

Other Centres:

• Warrior Preparation Center/7th Army Training Command (US in Germany)
• Combat Manoeuvre Simulation Centre, ARRC (UK in Germany)

Newer Centres:

• JHQNE (Stavanger, NO)
• Turkey
• Poland
• Germany
Where can I Send my Country Representative for a Postgraduate M&S Degree?

Study & Courses

- **Course applications.**
  If you wish to apply for a course then please visit our [Course Applications section](http://www.rmcs.cranfield.ac.uk/studycourses).

- **Postgraduate Courses**
  We have a wide selection of postgraduate courses available on a part-time and full-time basis. You can also find out more about other postgraduate courses available at Cranfield University. [Click here](http://www.rmcs.cranfield.ac.uk/studycourses) to find out more.

- **Short Courses**
  There are a wide selection of short courses currently available. Many of these courses are stand alone modules of MSc courses. Please go to our [Short Course section](http://www.rmcs.cranfield.ac.uk/studycourses) to find out more.
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Postgraduate Courses @ RMCS
Masters in Defence Acquisition Management
Masters in Defence Administration/Defence Management
Masters in Defence Sensors and Data Fusion
Masters in Defence Simulation and Modelling
Masters in Design of Information Systems
Masters in Explosives Ordnance Engineering
Masters in Explosives Ordnance Technology
Masters in Forensic Computing
Masters in Forensic Engineering and Science
Masters in Global Security
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