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Preface

Recent world wide events have clearly demonstrated that the military response required to the changing threat has to be dynamic, and this means the any military communications capability has to be able to evolve and keep pace with these changing needs. Also, over the past years there has been a merging of the technologies that are now required by both the military to keep ahead of the threat and the commercial world where consumer demands for greater mobility and access require new and evolving technologies. The need for advanced technologies for military communications was a important feature of the 4th NATO Regional Conference on Military Communication and Information Systems that was held at the Military Communication Institute in Zegrze, Poland, between the 9th and 11th October 2002. This conference was arranged by the Military Communication Institute, the NATO C3 Agency and the Military University of Technology (Warsaw), and is formally endorsed by the First Deputy Minister of National Defence of the Republic of Poland and the NATO Assistant Secretary General for Defence Support, and this journal includes 11 papers from the conference that are seen to have a wide application and convey novel and informative approaches to the advances in new communications technologies.

The main theme of this year's conference was *The CIS (Command, Control, Communication and Information System) challenge in the new environment*, and reflecting the current NATO operational priorities there was some emphasis on mobility, interoperability and standards. Over 60 papers were presented in two parallel tracks, and a further 20 were available in a poster session where attendees could discuss in depth specific topics with the authors. The subject matter of the presentations ranged from academic papers on modelling and simulation, sensor processing technologies (e.g. the use of neural networks for the identification of vehicles from their sound signature) and military CIS network topology to papers on specific CIS requirements and the national programmes to support these requirements. However, whatever application is developed to support the military planning and command chain, an essential need is to be able to reliably and securely exchange vital information and to disseminate the orders and operational and tactical information. This requires robust and novel communications technologies, and the selected papers are aimed at providing an insight into this.

With so many excellent papers it has been difficult to single out any particular contribution for special treatment, but space does not permit more than 10 to be published here. To assist in this selection in addition to quality the chosen theme for this year's special publication is "Military communications technologies", and the selected papers are intended to give the broadest possible coverage of this theme from the papers that were presented. In every case these papers suggest either a new approach to a problem, or give a different and innovative perspective that can be used to improve the ability of NATO alliance partners to interoperate over secure and resilient communication and information system networks. Many of these papers have been drawn from the presentations given by members of the Military University in Warsaw, and the Military Communication Institute in Zegrze, and reflect the high quality and innovative nature of the research that is undertaken by these internationally respected institutions. Included also are a representative number of papers from other NATO nations and agencies.

The specific topics covered in the compendium of papers attempts to address many of the issues that now face the military communications and information systems community. The greater emphasis on, for example, mobility is placing increased demands on transmission technologies to provide improved reliability, wider bandwidth and more data and communications protection. This places increased demands on secure cryptographic technologies and transmission security, and therefore the papers on the *Error probability and error stream properties in channel with slow Rician fading* and *Remarks on improved inversion attacks on nonlinear filter generators* are recommended reading. Quality of service is a critical factor in reliable military networks, and with the introduction of IP based networks the management of reliability and assurance of delivery is of growing importance. A paper has, therefore, been included that addresses the comparison of QoS issues in ATM and IP network. Traditionally the method of assuring interoperability was through the use of agreed data standards, but with more nations joining NATO and the difference in national procurement and modernisation cycles, a means of exchanging data between systems that use different protocols is needed. NATO has been developing such a system and this is described. Finally, in addition to the provision of a secure and reliable information network, the military has a need for efficient command and control applications that do not place an unacceptable burden on valuable bandwidth. These include the co-ordination of battlefield deployment and logistic planning and assessment and simulation tools (such as MoD-SAF), and papers are also included that support such concepts; in particular technique that are optimised for use over military networks.

In the limited space available it is not possible to include all the papers from the RCMCIS'2002 conference, and in selecting only a few it is recognised that justice has not been done to the remainder. However, the full proceedings of the conference are available from the Military Communication Institute, Zegrze.

Guest Editors: Wojciech Burakowski, Paul Kennedy, and Marek Amanowicz