First EU Radio Spectrum Policy Programme, Brussels, 20/9/2010

On 20 September 2010, the First Radio Spectrum Policy Programme was proposed by the European Commission for Decision by the European Parliament and the Council (COM(2010) 471 Final). The proposal on the use of the EU’s radio spectrum includes steps to promote efficient spectrum management, and in particular, to ensure that sufficient spectrum is made available for wireless broadband as a key action in the Digital Agenda for Europe. The programme outlines at a strategic level how the use of spectrum can contribute to the most important political objectives of the European Union from 2011 to 2015. It recognises the role of the JRC in the standardization process. (Article. 10).

Access to radio spectrum is essential for a huge range of activities from telephony and broadcasting through to transport and space applications, and it is crucial to ensure that EU citizens in both urban and rural areas can enjoy the benefits of digital technology and fast broadband connections. As not all the demand for spectrum can be satisfied, priorities need to be defined which ensure that spectrum is allocated and used in an efficient and effective way while ensuring the avoidance of harmful interference. More efficient and competitive use of spectrum in the EU would promote the development of innovative technologies and services, to the benefit of consumers and of Europe’s overall competitiveness. The Commission’s proposal is an outcome of the background studies and experimental measurements on radio frequency interference carried out by JRC to validate simulation results proposed by Member States through CEPT - European Conference of Postal and Telecommunications Administrations.

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The role of the JRC

Best Paper Award at the Seventh International Symposium on Wireless Communication Systems (ISWCS ’10) York, UK, 19/9/2010

Detlef Fuehrer and Gianmarco Baldini of the STA unit have received a best paper award at the Seventh International Symposium on Wireless Communication Systems (ISWCS ’10). The JRC scientists were recognised for their contribution “Implementation of a wireless test bed for the functional verification of the Ultra-Wideband Detect-and-Avoid mechanism” that they presented together with peers from AT4 Wireless S.A. and Telecommunication Metrology Center of China. The work was carried out under the FP7 project WALTER (2008-2009) and involved extensive tests in the EMSL laboratory.

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JRC Innovation Project Competition, Brussels, 16/7/2010

STA Unit has won the JRC Innovation Project Competition 2010 for its project proposal titled “Industrial Prototype of an All Weather Area Surveillance Device for Moving Target Detection”. Following an evaluation also involving qualified patent attorneys, the proposal was selected for funding for a maximum amount of 80k€. The objective of the Innovative Project Competition is to bridge the gap between the research at JRC and its utilisation by the industry or policymakers. The annual competition is run by the Intellectual Property and Technology Transfer Unit in the Programmes and Stakeholders Directorate of the JRC. A total of 400k€ is awarded each year to harness the most promising ideas proposed by the JRC scientists.

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Best Paper Award at the IEEE Global Communications Conference, Miami (USA) 8/8/2010

Alberto Rabbachin of the STA unit will receive the Best Paper Award at the IEEE Global Communications Conference (IEEE GLOBECOM 2010) to be held in Miami (USA) 6-10 December 2010. His paper titled “Statistical Modeling of Cognitive Network Interference” co-authored with Prof. Moe Win (MIT, USA) and Dr. Quek (2R, Singapore) is one of the 11 papers selected to receive this prestigious honor. As the flagship conference of the IEEE Communications Society, GLOBECOM is the premier global event for telecommunications industry professionals, academics and governmental agencies. This year, 3500 papers were submitted to the conference, of which 1300 were accepted and 11 best papers addressing different aspects of wireless communications, signal processing and networking were finally chosen to receive the Best Paper Awards.

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Meeting of the Inter Systems Interface (ISI) TETRA/TETRAPOL WG, Bussels 22/7/2010

The ISI TETRA/TETRAPOL working group includes representatives from industry (Motorola, EADS, Selex, Sepura) from government (Minister of Interiors of France and Germany) and Public Safety users (VTS Police Netherlands and Swiss Police). The working group is focused on the resolution of interoperability issues among users of TETRA and TETRAPOL across member states. Problems regarding standards and networks have been identified; their resolution will have a major impact on the harmonization of public safety networks and organizations across Europe and it is an important step in the process of European integration from a security point of view. Mr Baldini was invited to report on the outcome of the Public Safety interoperability workshop held in Ispra on the 28th/29th June and to provide the feedback of the European Commission on the ISI development.

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7th International Symposium on Wireless Communication Systems (ISWCS’10), York, UK, 19/9/2010

Researchers from STA Unit presented three papers and a tutorial at the ISWCS’10 conference (http://www.iswcs2010.org):
• “Implementation of a wireless test bed for the functional verification of the Ultra-Wideband Detect-and-Avoid mechanism” by Detlef Fuehrer, Gianmarco Baldini (IPSC-JRC), Janie Baños, Manuel García (AT4 wireless, Spain) and Xiaochen Chen (Telecommunication Metrology Center of MIL, China).
• “Aggregate Interference in White Spaces” by Alberto Rabbachin, Gianmarco Baldini (IPSC-JRC), Tony Q.S. Quek (IIR, Singapore).
• “A Quantitative Assessment of the Compatibility of Ultra Wideband with Radiolocation Services”, Joaquim Fortuny-Guasch, Alberto Rabbachin, Eduardo Cano-Pons, Detlef Fuehrer, (IPSC-JRC), and Pablo Almorox, (UPM Madrid).

IPSC-JRC and the NICT Japan organised a joint special session on Ultra Wideband technology during which findings from FP7 projects WALTER and EUWAB, and from various Japanese research projects were presented.

The scope of the conference included wireless communications, quality of service support, wireless networking, signal processing, wireless broadband access, and cooperative networking. Topics such as Cognitive radio, Mobile Internet, Wireless privacy and security, Spread spectrum systems were well represented.

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ICT Conference Brussels, 27/9/2010

STA Unit attended the ICT2010 conference held at Brussels Expo. The conference was organised by the European Commission’s DG INFSO and hosted by the Belgian Presidency of the European Union. The event gathered more than 5000 researchers, innovators and influencers who addressed policy priorities such as Europe’s Digital Agenda and the 2011-2012 financial programme of the European Union for funding research and innovation in ICT (2.8 billion euro). Furthermore, ICT 2010 showcased over 100 exhibits of the latest advances in digital technologies funded by the EU. Seven ICT research areas were covered:
• Smart Systems: robotics, neuroscience and virtual reality;
• ICT Inside: nanotechnology, quantum technology, embedded systems;
• Green ICT: energy efficiency control systems, smart houses and improved lighting technologies
• ICT Connects: RFD, supercomputing networks and future media;
• Digital Society: ICT for better ageing and health, e-government;
• Content and Knowledge: machine translation and e-learning;
• Safety and Security: ICT for transport, e-ID management.

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Participation to a field mission organised by FRONTEX Algeciras (Es), 24/8/2010

In the frame of the Joint Operation Minerva, Frontex has sponsored the deployment of the Slovak Ralen system, for detection of live human, in the Ferry Terminal of Algeciras. At present, only three Ralen systems are deployed: the first permanent installation at the border between Ukraine and Slovakia, a second system in Slovenia, and a temporary installation in Algeciras. The Frontex Research and Development Unit (RDU) has been tasked to observe the system in operation and report on the strengths, weaknesses, opportunities, and threats of the use of RALEN at border crossing points in view of potential future deployments in other joint operations or RABIT exercises. Frontex is currently trying to assess the performance and limitations of the Ralen system, in view of a possible purchasing of a Ralen system to be deployed in future joint operation exercises. This decision is expected to be taken in the coming months. Frontex may also request formally the support of JRC in the definition of the test scenarios and also in the evaluation of the system performance. A confirmation in this regard is expected in the coming weeks.

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PIMRC 2010 represents one the most important and world wide famous conference on radio communications. A large variety of topics were touched during this conference, with a large set of panel, tutorial and workshop sessions scheduled in parallel to regular sessions. Physical layer related techniques, such as: antennas and propagation, signal processing, MIMO transmissions and low-power design are some of the topics the authors were invited to contribute. Medium access control (MAC) protocols techniques, cognitive radio networks, next generation of mobile phone networks, multi-hop networks, sensor networks and ad-hoc networks are some of the topics that PIMRC included from a more systemic view point.

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Visit by the European Telecommunications Standards Institute (ETSI) to STA Unit, Ispra, 9/7/2010
Director of ETSI-CTI (Centre for Tests and Interoperability) made a visit to the STA unit during which ETSI and JRC scientists explored topics and ideas for new collaboration opportunities. CORSA team explained the technical areas of work in action, both current and future. A tour of EMSL was given. Four topics of potential interest were identified:
1. TETRA/TETRAPOL interoperability.
2. RF Co-existence in the context of Digital Dividend frequency bands.
3. Testability of ETSI requirements.
4. GNSS related standards.
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Report on Ultra Wideband (UWB) Low-Duty-Cycle (LDC) compatibility measurements for ETSI
Ispra, 26/7/2010
On July 26-27, a series of Radio Frequency compatibility measurements were conducted at the EMSL. During the event which had been arranged upon request of ETSI the impact of Low-Duty-Cycle (LDC) Ultra Wideband (UWB) on the quality of Mobile WiMAX services was investigated. LDC UWB, a technology to be used in location tracking applications for emergency services, is currently in the European radio regulation and standardisation process. A report of the results was prepared by STA and submitted to ETSI’s Task Group UWB; furthermore it was presented to the Spectrum Engineering Working Group of the European Conference of Postal and Telecommunications Administrations (CEPT).
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Participation in the The European Telecommunications Standards Institute (ETSI) Task Group (TG) UWB Meeting Stuttgart, 8/7/2010
Members of ETSI TG UWB met in Stuttgart to discuss the current situation of Ultra Wideband (UWB) standardization and the upcoming activities in this area. One of the agenda items was the upcoming UWB measurement event in Ispra (July 26-27). The objective of these UWB-Wimax compatibility measurements is to update European standards and regulatory documents for UWB devices implementing the low-duty-cycle (LDC) interference mitigation mechanism. Test requirements and parameters were discussed and agreed on. Measurements will be conducted in the lab in bldg 72 as well as in the EMSL. Several members of TG UWB will visit Ispra for this purpose. Other key topics were the re-structuring of standards documents covering UWB for location tracking applications (LT1, LT2, LTT, LAES) and the organisation of UWB activities within ETSI.
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Participation to the 11th meeting of ETSI Sophia Antipolis, Nice (FR), 7/9/2010
STA unit took part at the 11th ETSI meeting where Gianmarco Baldini presented the current activity in ETSI TC RRS Working Group 4 (WG4) dedicated to the Public Safety Communications and the status of related activities around the world. WG4 is currently working on the Work Item for Business & Cost considerations for the deployment of CR/SDR in the Public Safety domain. The need to define a standardization roadmap for SDR in the Public Safety and Defence domains was discussed in a second meeting with ETSI, EDA and NATO. This topic has been already addressed in the past through a number of activities including the WINTSEC and EULER project. Finally, Mr Baldini met the validation and verification group of ETSI to discuss potential collaboration.
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Meeting of the Task Group Ultra Wideband (TG UWB) of the European Telecommunications Standards Institute (ETSI), Montegrotto Terme (It), 9/9/2010
The following subjects were discussed:
• Location Tracking and sensor Applications for automotive and transportation environments (LTA) in the frequency bands 3.1 - 4.8 GHz and 6 - 8.5 GHz
• Airborne UWB in the frequency bands 3.1 - 4.8 GHz and 6 - 8.5 GHz
• Medical Applications
• Wireless Factory
• LDC Specialist Task Force
The compatibility study between Mobile WiMAX (IEEE 802.16e-2005) and UWB LDC that had been produced by the JRC upon request from ETSI was presented in the context of UWB applications for location tracking. The study had previously been submitted to the ECC’s Spectrum Engineering and Frequency Management Working Groups (SE24 and FM47) to be reviewed and commented. It is expected that additional measurements will be requested by the ECC and ETSI. The results of such additional measurements would have to be presented before the end of the year, so that the ongoing updates of the ECC decision on UWB and the corresponding standards documents of ETSI can be finalised.
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FP7-Security Project HELP
Brussels, 1/7/2010

On behalf of the JRC, STA unit in the project Consortium for the FP7-Security Project HELP has started negotiations with the EU research agency REA. The HELP proposal is in the context of Public Safety and addresses the lack of broadband connectivity for Public Safety users. It will investigate innovative ways based on spectrum sharing and network sharing to provide broadband connectivity to public safety end-users during an emergency crisis or a major event. The project will define and establish the foundations for the development of network and spectrum sharing concepts between networks by identifying outstanding technical advances with respect to current state-of-the-art. It will also identify the key features and functional building blocks of the operations and management system needed to achieve a synergic and holistic operation of the composite radio systems.

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Crescendo Project Meeting WP6
Rome, 23/7/2010

STA unit participated in the FP7-Security coordination action project Crescendo which aims to prepare an R&D road map for security technologies by assessing the risks, evolving threats and current security research. The project focused on the WP6 - R&D Roadmaps. The meeting was organized by Finmecanica and included participants from EADS, AFNOR, VTT, Sagem, FOI and Fraunhofer Institute. At the end of the meeting, a methodology for the development of a roadmap was agreed based on the DG ENTR matrix of capabilities and projects.

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Participation in two project proposals for the Security Research Call 2010 of DG ENTR, Gramat (Fr), 15/9/2010

The “Commissariat à l’Energie Atomique et aux Energies Alternatives” (CEA Gramat) invited STA Unit to join two project proposals for the Security Research Call that is currently open. The meetings were organised to meet all partners and to discuss about the precise focus and organisation of the two projects: The first proposal addresses a priority topic of the Security Research Call on the development of safe measures to stop vehicles remotely (capability project). This topic was suggested by Police organisations in several Member States. Stopping vehicles safely is a current need of Police forces. The second meeting was devoted to discuss the preparation of a second project proposal on the topic of protection of Critical Infrastructures Protection (CIP) against electromagnetic threats.

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Patent on an UWB radar imaging system
Ispra, 26/8/2010

STA unit has passed the evaluation stage of its EPO patent application “An ultra-wideband radar imaging system using a two-dimensional multiple-input multiple output (MIMO) transducer array”. Carried out in the frame of the PROBANT project under the Preparatory Action for Security Research (PASR) preceding FP7-Security programme, CORSA action had technical partners from the Delft University of Technology (NL) and SATIMO (FR) who are joint applicants to this patent claim.

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Synthetic Aperture Sonar and Synthetic Aperture Radar International Conference
Lerici (Italy), 12/9/2010

STA unit presented a paper entitled “GB-SAR and MIMO Radars: Alternative Ways of Forming a Synthetic Aperture” authored by P.F. Sammartino, D. Tarchi and F. Oliveri. The Synthetic Aperture Sonar (SAS) and Synthetic Aperture Radar (SAR) International Conference brought together people working in these two similar fields, who often ignore each other’s work. Contributions in terms of papers and attendees came mostly from Europe and the US. The JRC paper attracted keen interest from many of the attendees.

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Pseudolites (Pseudo satellites, PLs) are ground based radio transmitters that transmit a RNSS-like navigation signal. They are intended to be complementary to RNSS systems and transmit on the same frequency bands 1164-1215, 1215-1300 and 1559-1610 MHz as RNSS systems. There are several other Radio Services and Radio Navigation Service itself that could be affected because of uncontrolled use of Pseudolites therefore it was decided to conduct sharing/compatibility studies between Pseudolites and Services on the frequency bands 1164-1215, 1215-1300 and 1559-1610 MHz. GNSS services and security is an important area for European industrial competitiveness, especially in the context of the future EGNOS/Galileo systems and applications. In this context, Pseudolite technology represents an important “building block”, which requires technical assessment and guidance in a short timeframe.

CEPT SE40 meeting on Satellite Services and the use of Pseudolites Pozzallo (It), 23/8/2010

Pseudolites (Pseudo satellites, PLs) are ground based radio transmitters that transmit a RNSS-like navigation signal. They are intended to be complementary to RNSS systems and transmit on the same frequency bands 1164-1215, 1215-1300 and 1559-1610 MHz as RNSS systems. There are several other Radio Services and Radio Navigation Service itself that could be affected because of uncontrolled use of Pseudolites therefore it was decided to conduct sharing/compatibility studies between Pseudolites and Services on the frequency bands 1164-1215, 1215-1300 and 1559-1610 MHz. GNSS services and security is an important area for European industrial competitiveness, especially in the context of the future EGNOS/Galileo systems and applications. In this context, Pseudolite technology represents an important “building block”, which requires technical assessment and guidance in a short timeframe.

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STa Unit attended this meeting in view of the interest of DG ENTR F2 unit in technical and regulatory issues related to pseudolites. SE40 is the project team in the CEPT Working Group ’Spectrum Engineering’, focused on technical studies relating to space services including GNSS. SE40 works closely with FM44, which is the project team responsible for reviewing the existing ERC/ECC decisions to satellite networks and earth stations. An outcome of the meeting is that further studies for the research and assessment of PL mitigation techniques are needed. CORSA action has the technical capability to perform most of these studies on the basis of its extensive experience in wireless interferences, GNSS vulnerabilities, wireless communications techniques and the resources of the European Microwave Signature Laboratory (EMSL). Candidate topics are:

- Assessment of PL mitigation technique based on PRN 1-32 signals.
- Assessment of interference of Pseudolites in indoor environment.
- Aggregate interference of PLs on airborne non-participative receivers.

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Galileo Infrastructure and Security
Brussels, 8/9/2010

DG-ENTR.DGA2.GP3 requested the JRC to incorporate in its WP2011 specific items to study the security of global navigation satellite systems (GNSS) including the Galileo system of the EU. The request was prompted by a study carried out by the JRC for DG JLS (now DG HOME) on radio frequency threats to GNSS through intentional or unintentional radio interference.

Five items of specific interest to ENTR. GP3 unit are:
- pre-impact assessment of designation of Galileo as a critical infrastructure,
- multi-GNSS interference,
- co-existence of GNSS and radar systems
- jamming and spoofing threats to GNSS signals
- regulatory issues of pseudo-satellites.

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Civil Navigation and Timing Security Workshop
Portland (USA), 23/9/2010

STA unit is organising a technical workshop jointly with the US researchers on the security of Global Navigation Satellite Systems (GNSS). Concurrently with the Institute of Navigation conference ION GNSS 2010 in Portland OR, USA, the workshop will focus on the technical challenges in securing the civil GNSS signals against the threats of jamming and spoofing.

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Training Course:
GNSS Software Receivers
Ispra, 1/7/2010

STA unit organised a 2-day training course offered by Professor Dennis Akos, University of Colorado at Boulder, USA. On the first day, an introduction was given to software receivers, GPS/GNSS, front-end/radio aspects, and much of the internal processing: low-level GPS signal processing, navigation data exchange and observable estimation, timing and positioning computation. On the second day we gave an overview of radio frequency interference (RFI) for GNSS receivers and RFI mitigation.

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Director of “Centre d’études de Gramat” (CEA) visits EMSL
Ispra, 27/7/2010

Director of CEA Gramat made a visit to the IPSC during which he also visited the STA unit and its EMSL laboratory. A presentation and demonstration was given on the GNSS vulnerabilities and in particular on the risks of GNSS jamming and spoofing, their detection and countermeasures. JRC’s CORSA action is developing a laboratory based testbed for GNSS security studies that was used for practical demonstration of intentional and unintentional radio interference with GNSS and novel methods for the detection of jamming and spoofing attacks. CEA expressed keen interest in join RTD project in the next security research call in the area of Radio Frequency (RF) threats to GNSS systems.

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Experiments with a dual channel GNSS receiver done at JRC