IEEE DySPAN 2008 Demonstration Track
Call for Proposals

Introduction

IEEE DySPAN 2008 will provide the opportunity to conduct live demonstrations of dynamic spectrum systems and networks. This year's event will build on the huge success of the demonstrations at IEEE DySPAN 2007 by offering an invaluable opportunity to **demonstrate, experiment, and interact** with other world-leading researchers. This is a call for proposals to demonstrate systems, prototypes, and critical technology components and algorithms at IEEE DySPAN 2008.

IEEE DySPAN 2008 will be held in the Millennium Knickerbocker Hotel, Chicago, IL from Oct. 14 – 17th 2008. Further information regarding the symposium is available at http://www.ieee-dyspan.org/2008/

In addition to pre-planned demonstrations, unique opportunities may exist for experimentation by participants. Such opportunities include general measurements of spectral activity during the demonstration and experimentation sessions; the interaction of various, independently-developed systems and networks; and the coexistence of systems using different spectrum adaptation algorithms.

To participate in the demonstration and experimentation activities, candidates must complete the attached form to provide a description of the proposed demonstration and/or experimentation. The proposals will be evaluated by the DySPAN demonstration committee based on the following criteria:

- **Technical Significance**: the extent to which the demonstration illustrates advances in dynamic spectrum access technologies.

- **Demonstration Maturity**: the demonstration must be mature enough "to leave the lab." Demonstrations involving RF transmissions must include *a priori* or *in situ* risk mitigation measures to ensure regulatory compliance and coexistence with other spectrum users.

- **Demonstration Supportability**: the demonstration must be performed within the capabilities and resources of the DySPAN symposium. Demonstration systems should ideally coexist with other potential demonstrations on a coordinated or uncoordinated basis.

The selected demonstrations will undergo a final review approximately 45 days prior to the symposium to ensure their operational readiness.

Accepted proposals are encouraged to submit a two to four page demonstration description to be included in the DySPAN 2008 proceedings.

Important Dates

February 29, 2008	Complete attached proposal form and submit to dyspandemos@ctvr.ie
April 1, 2008	Notification of demonstration proposal acceptance
September 1, 2008	Submission deadline for demonstration paper
October 14-17, 2008	DySPAN symposium

Regulations and transportation

Regulatory licenses will be negotiated and procured by the demonstration committee based on submitted system capabilities. It is therefore necessary to have knowledge of all possible frequency ranges a device is capable of using if certain frequencies are restricted for experimental use in Chicago.

It is the responsibility of each demonstration participant to secure shipping and handling of their equipment to and from the demonstration site. Those companies/research institutions that will ship equipment from outside of the US may wish to arrange a Carnet. The Carnet is a type of "Merchandise Passport" that can be used as proof that you are temporarily importing commercial samples or professional equipment for exhibition in the host country. US Customs and Border Security is part of the Carnet program as are many other countries. Demonstrators from countries that do not participate in this program will need to contact their local customs officials to facilitate transportation. A suitable link to learn more about Carnets is: http://www.uscib.org/index.asp?documentID=718

Other points of note:

- Moving large amounts of electronics through an airport (especially customs) is going to take time. Consider using airfreight for transferring equipment. Otherwise, prepare well in advance and be sure to have all supporting documentation on hand.
- It is also advised that participants consider insurance for any hardware during the symposium and shipping process.
- To obtain a shipping address for the symposium, send a request to dyspandemos@ctvr.ie

Contact Information

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www.ieee-dyspan.org/2008/

DySPAN 2008 Demonstration Proposal

Complete the following form with as much detail as possible. This information will be used to evaluate suitability of admission into the DySPAN Demonstration Session based on the technical significance to the symposium, demonstration maturity, and demonstration supportability.

Contact Information

Primary Contact Name	David Jones
Organization	Shared Spectrum Company
Address	1595 Spring Hill Road, Suite 110 Vienna, VA 22182
Phone Number	703-761-2818
Email Address	djones@sharedspectrum.com

Abstract

Provide a concise (300 words) summary of the proposed demonstration and its technical significance.

Shared Spectrum Company's (SSC) proposes to demonstrate several new Dynamic Spectrum Access (DSA) features at the DySPAN 2008 Conference. These features include high-level language, policy-based radio control, operation using a small, low cost general purpose processor (GPP), and improve building penetration using multi-band operation. The demonstration will involve three DSA radios and two command and control laptop terminals.

This demonstration provides validation of several technical innovations. (1) The policy-based control will show spectrum sharing using complex constraints from multiple "peer" stakeholders. Our demonstration will have two command and control terminals provide different, time-varying, complex and conflicting spectrum access rules to the radios, and the radios will select the correct access rules. (2) Operation with a low cost GPP shows the economic viability of our DSA radios for a wide range of commercial applications. Our demonstration will have the DSA radios executing a wide range of functions using the cost GPP component. (3) Building penetration and link range are the most important economic factors in wireless deployments. By selecting the best operating frequency, the propagation loss is reduced 20 dB to 30 dB compared to an arbitrary selected frequency. Our demonstration will have three DSA radios operating over-the-air. The DSA radios cover multiple frequency ranges (225 MHz - 512 MHz, 1215 MHz - 1390 MHz, 1435 MHz - 1525 MHz, 1755 MHz - 1850 MHz, and 2200 MHz - 2290 MHz). The best operating frequency will in general be at unknown frequencies and bands depending on the propagation conditions in the room. By using a variable attenuator to add additional attenuation to the links (in addition to the over-the-air loss), we steadily increase the link loss between the transceivers. The rendezvous DSA algorithm adaptively determines the best operating band and frequency to achieve link closure through buildings and other obstacles.

Description

The description should include sufficient detail such that the evaluators can understand the purpose, configuration, design, and conduct of the demonstration/experiment.

Primary technical goals

The primary technical goals are to show new DSA functionality that provides significant utility to network operators. (1) This includes the ability to accominidate complex spectrum use limitations that are important to spectrum stakeholders in a complex peer-to-peer control scenario, (2) The ability to have high DSA functionality when utilizing cost effective hardware, and (3) The ability to significant reduce building penetration propagation link losses by finding and tracking the "best" operating frequencies.

Description
Pictures, screen shots, and system drawings are encouraged (attach as necessary)

Attached are several figures that describe SSC's DSA transceivers.

Operational parameters

Frequency Ranges	225 MHz - 512 MHz, 1215 MHz - 1390 MHz, 1435 MHz - 1525 MHz, 1755 MHz - 1850 MHz, and 2200 MHz - 2290 MHz
Bandwidth	1.75 MHz, 3.5 MHz and 7.0 MHz
Peak Input Power to Antenna	10 W (225 MHz – 512 MHz) 10 dBm in all other bands.
Antenna polarization and gain	Vertical, 0 dBi
Waveforms (modulation type)	OFDM

Technical Significance

Address the technical significance of the demonstration/experiment.

Description of the technologies

See attached briefing.

A discussion of the perceived impact of the demonstration to dynamic spectrum in general and the DySPAN audience in particular

The goal of our demonstration is to show the commercial applicability and economic benefit of DSA.

Most other DSA papers and demonstrations are technical in nature and do not provide a significant economic motivation for DSA. We believe that the technical issues related to DSA have now been well covered by SSC and other companies.

This will be the first DSA demonstration that provides compelling evidence that DSA radios offer significant, near-term benefits to network operators.

Technical Maturity and Operational Capabilities

Provide sufficient detail regarding the maturity of the demonstration/experimentation.

Current state of the technology, hardware, and software

See attached briefing.

Amount and type of work yet to be done prior to DySPAN

None

Risk mitigation methods to be implemented to ensure proper operation within regulatory constraints

The radios will operate using a Listen-Before-Talk algorithm that will prevent operation if other signals exist on the channels of interest.

Our software utilizes frequency lock-outs to insure that no transmission at prohibited frequencies occurs.

Our team will use a spectrum analyzer to monitor our transmission frequencies.

Our transceiver has bandpass transmission filters to reduce our out-of-band transmissions.

Previous experience and trials of demonstration equipment's coexistence with other communication systems Note that a summary of existing test results may be useful in conveying the operational readiness and stability of the demonstration/experiment	
SSC participated in the DySPAN 2005 conference, the Trident Warrior 2007 test with the U.S. Navy, has performed air-to-ground tests using an airship platform, and has conducted extensive outdoor field tests at Fort A.P. Hill in Virginia.	

Logistical Needs

Include the logistical needs for supporting the demonstration/experiment at DySPAN. These details allow the planners to properly acquire and allocate resources to support the demonstrations.

Amount of space required (sq. ft or sq. m)	30 sq. ft
Number of demonstration tables required	Two demonstration tables.
Input power requirements and number of outlets (note: US uses 120V, 60 Hz power with a NEMA 5 (flat 3-prong) plug)	Approximately 7 outlets are required.
Approximate power consumption	Approximately 500 W power is required.
Storage and security requirements for equipment	Secure overnight storage of test equipment is required.
Instrumentation and other support equipment requested of DySPAN	None.
Internet/network access (wireless, wired, number of ports, etc.)	Not required,
Other needs	None.

Checklist

[X] Contact information is complete and accurate
[X] Abstract
[X] Description is complete, including all operation parameters requested
[X] Technical specification
[X] Technical maturity and operational capabilities
[X] Logistical needs described as fully as possible

[X] We grant permission to make the information in this proposal public.