



ECTEC COGNITIVE RADIO TEST ENVIRONMENT (INTRODUCTION)

OVERVIEW

The ECTEC Cognitive Radio (CR) Test Environment whitepaper presents a discussion of the test capabilities needed for the successful test and evaluation of new technology radio products, including cognitive radios, covert radios using low SNR and operating co-channel / adjacent channel with other legacy or contemporary technology-based radios, and multi-user devices associated with PCS technologies. The paper is organized into six sections with a focus on the test of cognitive radios, these being the most fundamentally challenging of the new technologies and the most likely to be prevalent in the signal environment of the expected battle space.

Section 1

An abbreviated description of the how the cognitive radio operates within the spectral domain occupied by other more traditional users is discussed. This is offered from the perspective of the outside observer and no particular attention is paid to the complex and sophisticated inner-workings of the actual radio platform. This ends with a concise statement of the fundamental operating requirement for the CR.

Section 2

This section presents a translation of the generally applicable radio performance metrics into key measurement capabilities required in the test evolution. The test evolution includes both laboratory and Over-the-Air (OTA) field test environments. Proper and effective support for the evaluation of the first order performance metrics is the uncompromising objective.

Section 3

The measurement metrics and the test equipment and scenario requirements that will need to be addressed are identified to support the test evolution. This of course includes both measurement and stimulus instrumentation and the supporting means to deploy them and to assure the collection of true, measured data.

OEM for high performance, wide bandwidth microwave receiving systems used for signal surveillance, reconnaissance, and localization in maritime, terrestrial, and airborne applications



Section 4

Two fundamental elements of the test methodologies are essential to implement successfully for assessing the test results and evaluating the product performance. These two elements are: 1) wideband spectral mapping, and 2) real-time, multiple-domain signal collection and analysis. This section describes these elements within the context of CR test and evaluation.

Section 5

In this section we review the instrumentation developed by ECTEC that have application to the test requirements for cognitive radio. These bring useful capabilities and provide reliable data for the cognitive radio evaluation. Test plans, test procedures, rigorous acceptance criteria, and thoughtful application of the available resources provide a solid basis for establishing the assessment of the radio performance metrics.

Summary

It is our intention that this approach become a basis for a larger and more thorough discussion of the performance of the new technology-based products and a way to adequately provide for an assessment of their performance.

ECTEC provides a very efficient and low-cost test capability with all of the features and functions to generate and analyze the cognitive radio environment and evolve as future requirements emerge. This can be in the form of a turn-key facility operated by us or the customer. In addition, our in-house test capability provides the same features and functions and can be quickly and easily configured for test and evaluation needs for those situations without the necessary laboratory or range assets.

Call us for more information and to receive a copy of the white paper.

