



13 July, 2007

To: Organizer of UWB Wireless System Committee, MIC
From: SARA Chairman
Subject: **A Short Overview of SARA's Frequency Strategy**

Dear Sirs

The SARA Steering Committee has been working since the summer of 2006 on an advanced frequency strategy to respond to the global situation for automotive radar. Our work has focused especially on Europe and Japan, recognizing that Japan plays an important role and can be a model for a worldwide approach. This letter is intended to give you a brief overview of the situation.

General Situation

The Mercedes-Benz S-class equipped with UWB Short Range Radar (SRR) operating at 24 GHz was introduced to the market in September 2004. BMW followed in January 2007 with the 5-Series equipped with 24 GHz SRR. SARA continues working on the frequency allocation for 24 GHz SRR in the important markets to allow further market entry. Up to now more than 50 countries allow the automotive industry to sell cars with 24 GHz SRR. We hope that Japan will also allow the introduction of this technology soon.

Frequency regulation in US

In 2002, the US FCC authorized operation of SRR in the frequency range 22 – 29 GHz. The center frequency must be higher than 24.075 GHz but there are no restrictions on the car fleet in time or quantity. Emissions into the passive band (23.6 – 24 GHz) where the Earth Exploration Satellite Services (EESS) operate must be reduced above an elevation of 30 degrees - in the direction to the satellites –by 1 January 2005, 2010 and 2014 every time by 5 dB.

One of the possible technical measures for a pulsed SRR system in the US is to shift the center frequency up to a frequency around 26.5 GHz. Tyco Electronics decided to rely on the flexibility of the US regulation and will implement this measure in a few years.

Possible frequency regulation in Japan

In 26 March 2007, SARA presented its proposal for a possible frequency allocation in Japan. The proposal is as follows:

1. Start with 24 GHz SRR as soon as possible.

Cars equipped with 24 GHz SRR are on the market and can contribute to road safety immediately.

SARA proposes that the 24 GHz frequency allocation should remain in place until 2016 as a sunset date, which would allow Japanese car manufacturers to deploy SRRs with this technology during a complete car line manufacturing period. In this relatively short period of time the number of cars and the car fleet penetration would remain very low. Thus, any risk of harmful interference would remain negligible.

The rules should permit cars with 24 GHz SRR to continue using their 24 GHz sensors during the cars' life time. In case of repair the 24 GHz sensors should be replaced by the same technology, because this does not change the assumptions in the compatibility study.

2. Frequency allocation for SRR in the frequency range 24 – 29 GHz, which is the upper part of the US regulation.

This allocation avoids any intentional emissions into the passive band (23.6 – 24 GHz) where EESS and RAS (Radio Astronomy Service) are allocated. Therefore, there is no reason to impose any restrictions in time and quantity because of EESS or RAS operations. Also deactivation of the sensors in the vicinity of RAS sites is not necessary.

Any frequency allocation for automotive SRRs must avoid restrictions in time and quantity because these limitations will block implementation by car manufacturers due to long production cycles and missing return of investments required for development, qualification and production line construction.

Sensors at a frequency around 26.5 GHz will be available in a few years. An early frequency allocation provides the needed planning safety for the industry.

Frequency regulation in Europe

The European regulation allows production of new cars equipped with 24 GHz SRR until 30 June 2013. After this "sunset date" new cars have to be equipped with 79 GHz SRR. This time restriction is based on the assumption that the car fleet penetration will reach 7%, a value for which the compatibility situation for EESS was assumed to be acceptable.

These restrictions in time and quantity are a serious hurdle for the implementation of 24 GHz SRR into new car lines.

Frequency regulation worldwide

The Japanese frequency allocation around 26.5 GHz could be a model for a worldwide flexible frequency allocation for SRR. Therefore the Japanese frequency regulation is of great importance.

Frequency allocation of 79 GHz band worldwide

SARA also proposes an additional frequency allocation in the 79 GHz band.

SARA members are involved in the development of the 79 GHz technology. This technology is required in the European package solution based on both 24 and 79 GHz and this 79 GHz frequency band is already allocated in Europe. SARA asks for a permanent and worldwide available 79 GHz UWB SRR frequency allocation.

Best regards

A handwritten signature in blue ink, appearing to read "G. Rollmann". The signature is fluid and cursive, with the first letter "G" being particularly large and stylized.

Dr. Gerhard Rollmann
SARA chairman