

# Advanced ultrasonic sonars for navigation of mobile robots

ES programme: INCO-COPERNICUS

## The objective of the project

To develop multichannel ultrasonic sonar based on the binaural approach with following features:

- ▶ Simultaneous determination of position of multiple targets;
- ▶ Robust operation in the sophisticated and noisy environment;
- ▶ Reliable detection of the reflected signals in the wide dynamic range;
- ▶ Simulation of sonar performance.

## Operation principle of the developed system

The system consists of:

- ▶ 4 ultrasonic transmitting transducers (E1-E4);
- ▶ 5 ultrasonic receivers (R1-R5);
- ▶ Electronic units for generation of driving coded signals;
- ▶ Amplification of the received signals;
- ▶ Parallel signal processors
- ▶ Ultrasonic signals are transmitted by two single side-looking transducers (E1,E4) and two front looking electronically steered honeycomb arrays (E2,E3), each of which consists of 3 MURATA 40 kHz transducers;
- ▶ The received signals in each receiving channel are converted into a digital form by 8 bits 250 kHz sampling frequency A/D converters;
- ▶ The sensor developed enables to detect various objects (walls, 90° corner type reflectors, furniture) and to measure their coordinates on-line up to 5 m.

## RELATED INFORMATION

1. **R.Każyś**. Advanced Ultrasonic Sonars for Navigation of Mobile Robots. Automation 2001. Przemysłowy Instytut Automatyki i Pomiarów. Warszawa. 2001. 24-40.

