

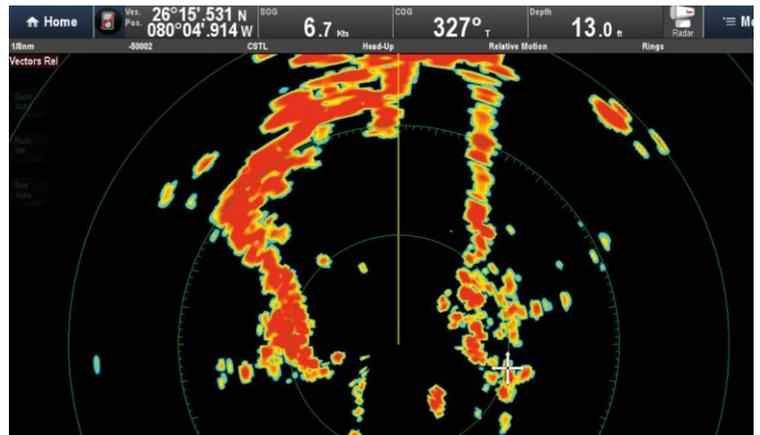
Modelling and design of a new chirp based marine radar

Raymarine wanted to develop a low cost digital dome radar for the marine market. They approached KEIKY to perform the modelling of the system and to aid in the development of the signal processing chain to reduce development costs by discovering issues upfront in the model.

KEIKY performed the system modelling and development using Matlab and Simulink. The signal chain included components such as pulse shaping, CIC filters, BiQuad filters, fixed point arithmetic, correlation, etc. The Simulink model allowed simulated targets to be added to investigate specific issues and ensure design constraints were met.

Matlab scripts were used to generate C header files for the DSP and configuration files for the FPGA.

A graphical user interface was also implemented in Matlab which allowed simulated targets to be generated for a signal generator.



The VISA Ethernet protocol was used to control and send data to the signal generator via the Matlab GUI. The use of the signal generator allowed the hardware receive chain to be tested at the radar frequency. The GUI was also verify useful for hardware validation.

The development work by KEIKY resulted in a number of new radar signal processing algorithms, for which patents were filed.



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