

Digital TIGER radar receiver- an outline of possible architectures

M. Nguyen, J. Devlin, J. Whittington.
Department of Electronic Engineering,
La Trobe University, Australia.

In recent years, the use of digital receiver technology in telecommunication systems has led to a dramatic increase in performance and reduction in cost. Digital techniques continue to replace analogue functions in communication systems as improvements are made in digital integrated circuit and analogue to digital conversion (ADC) technologies. At La Trobe University we are researching a digital implementation of the current analogue TIGER radar receiver. The proposed digital receiver will work in the range 8-20MHz with a 100KHz bandwidth. Compared with the analogue design, a digital version can provide better performance and more flexibility. A Field Programmable Gate Array (FPGA) implementation has been chosen due to their relatively low cost and inbuilt reconfigurability. The proposed digital receiver will have, as a minimum, the same specifications as the current analogue receiver. However, new digital techniques should allow greater configurability so that the receiver can be optimised for different operational modes. Three different architectures: direct sampling, IF under sampling and RF sampling, have been investigated and compared.