

Will there be more opportunities for embedded COTS suppliers in radar upgrades and new platforms?

By Xavier TATOPOULOS and Pascal BRECHAT

Radar manufacturers commonly use components or sub-systems from Commercial-Off-The-Shelf (COTS) suppliers. This principle allows customers to access the latest technologies while optimizing development cost, time and mitigation of component obsolescence. For embedded COTS suppliers, dealing with such projects means to assure delivery and maintenance of products for many years.

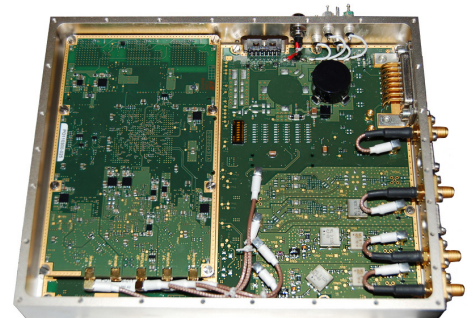
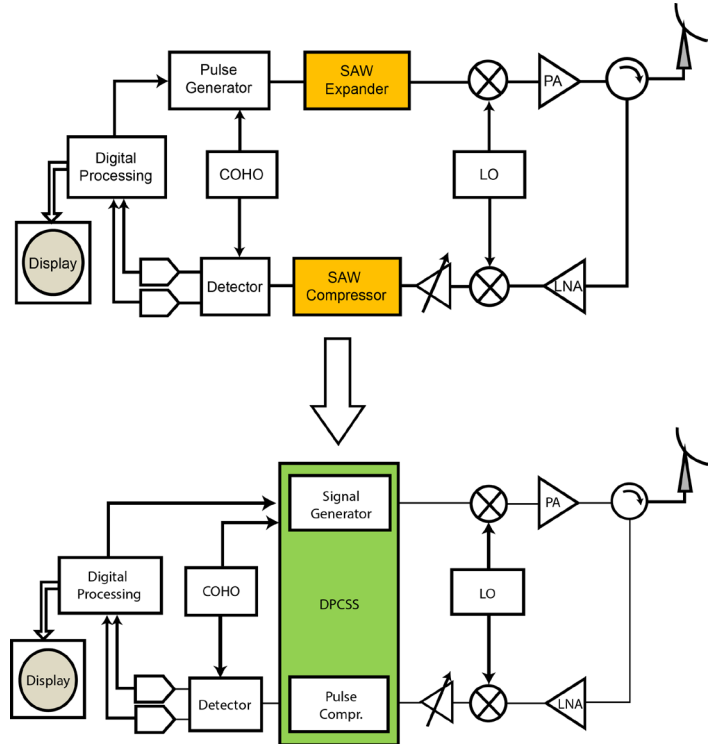
From the user side, due to the huge investment that represents new platform purchasing, the key factor is to increase radar equipment lifetime and performance. This requirement is even more important today due to the tough economic period which has drastically decreased budgets. Consequently, radar upgrade and life extension has become a compelling trend in the radar market: it is always better replacing one sub-system rack to extend equipment life for ten or twenty years rather than replacing the complete system.

Rakon, a global high technology company that designs and manufactures world leading frequency control solutions, has been a key supplier to the radar retrofit

market for many years. Rakon's expertise in this technology domain has identified a critical part that obsolescence creates trouble in radar maintenance: the surface acoustic wave (SAW) pulse compression sub-system. In pulse compression radar, the expander (which generates chirp into the transmitter path) and the compressor (for pulse compression into the receiver path) are usually done using SAW dispersive delay lines. However, these very specific components are hardly replaceable for radar developed twenty or thirty years ago! To answer this problem, Rakon has developed a Digital Pulse Compression Sub-System (DPCSS) to be the ideal solution when retrofitting or upgrading existing SAW based pulse compression radars. Not only does it enable a remarkable improvement in the overall system performance and extend the life of the system, but it also can be form fit and function compatible with existing SAW or digital units - making it easy and convenient to use in all military and civil radars.

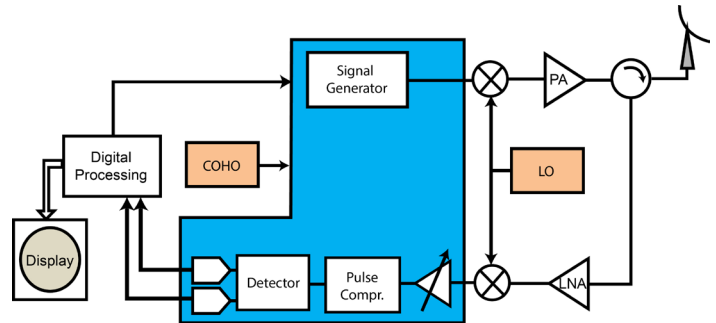
Thanks to a powerful and scalable FPGA-based digital technology, the performance achieved is close to the theoretical limits; enabling improved aircraft detection. This means a higher instantaneous dynamic range (side lobe level 5dB better than SAW based systems), higher accuracy angular measurements (main lobe without base widening), higher flexibility (programmable parameters enabling customization in waveforms and software upgrades), and repeatable performance from one device to the other as well as along the operating temperature range.

Rakon's DPCSS has been successfully implemented in several military and ATC radar upgrade projects since 2006 and is expected to become the leading solution to answer the growing demand in radar maintenance and life extension.



However, radar upgrades is only a starting point within the global radar market as further requirements have been identified. The increasing demand for high value-add sub-systems is accelerating the transformation of radar manufacturers' towards a systems integrator role and as a way to access innovative technologies that otherwise would have been out of investment range.

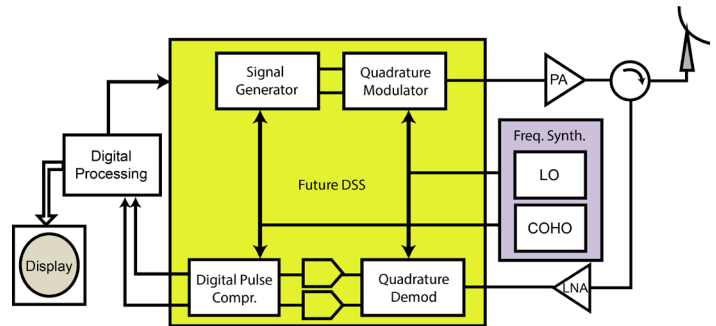
As a key technology partner with strong experience acquired in the field of radar retrofit, Rakon is able to provide additional embedded functions, including signal generation in transmitter part, IF amplification, pulse compression and detection on receiver part. Combined with Rakon's expertise in the frequency control domain, where ultra low noise OCXO (BAW technology for 10-100MHz band) and OCSO (SAW technology for 300-2000MHz band) can be provided as very high performing local oscillators; Rakon has a portfolio of leading solutions for radar modernization programs and new platform developments.



This new level of integration into a so called Digital Sub-System (DSS) simplifies the global radar architecture, thus reducing mechanical size (less racks), cost and maintenance.

In the near future, Rakon's capability to integrate even more analog functions into a highly integrated digital sub-system will offer the radar market even more sophisticated options.

For the radar manufacturer, beyond the economic interest, flexibility and strong performance improvement; the significant advantage resides in obsolescence management. Based on well standardized tools and platforms, Rakon's digital solutions drastically lower obsolescence risk or at least keeps it easily manageable.



While for COTS suppliers, the main challenge will be to keep delivering technological advances combined with offering the market competitive commercial solutions to meet the demanding requirements of the radar manufacturers.

For more information see <http://www.rakon.com/products/families/pcss>

Contact: info@rakon.fr or sales@rakon.com