CSIR Digital Radio Frequency Memory technology

The CSIR has developed Digital Radio Frequency Memory (DRFM) technology that is highly programmable, operates over a wide frequency band and is able to generate high fidelity emissions.

This DRFM has shown its mettle in laboratories and field deployments against operational scenarios that include surface and air-based radar systems.

This is a critical building block in the CSIR's own arsenal of radar and electronic warfare (EW) capabilities, built over more than seven decades.

Now in the fifth generation of this system, more than 110 El have been delivered to six different continents over the past 20 years.

The DRFM is used by CSIR researchers as the core of the EW environment simulator systems.

These systems include those used for:

- The evaluation of an operational radar's robustness against jamming;
- Acceptance testing of new radar systems;
- Research and development (R&D) in radar technology – such as testing of tracking filter and advanced electronic countermeasures and counter-countermeasures;
- The training of users such as pilots and radar engineers; and
- Doctrine development.

Clients who have acquired CSIR DRFMs include organisations that are developing or procuring radar systems and require an independent test and evaluation system for acceptance. It is also attractive to organisations that are developing their own EW simulators.
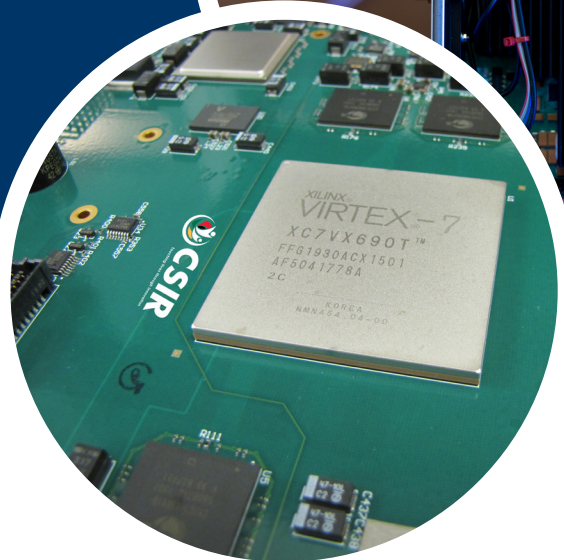
By introducing realistic targets, electronic countermeasures (ECM) and a realistic clutter-rich environment to the radar under controlled test conditions, performance characteristics and design constraints can be identified without resorting to expensive (and difficult to control precisely) field tests. Conversely, developers of a radar system can also verify detection characteristics early in the development cycle, reducing risk and saving cost.

Most other suppliers have a catalogue of only certain possible solutions from which the end user must choose, while the CSIR system is more flexible and designed around the specific user's requirements.

Specifications include:

- Wideband instantaneous bandwidth: up to 2 GHz;
- 10-bit analogue to digital, 12-bit digital to analogue;
- Delay resolution: 0.2 ns;
- Spurious-free dynamic range: 50 dBc;
- Digital instantaneous frequency measurement; and
- Up to eight overlapping, independent scatterers, which can be controlled (range, amplitude, phase).

Contact: Brian Burmeister **| E:** bburmeister@csir.co.za **| www.csir.co.za**

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Department:
Science, Technology and Innovation
REPUBLIC OF SOUTH AFRICA

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