



## Abstract

### Development of RF Components for Multibeam Radar Applications (A study case of CC-OFDM Radar Development)

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Indonesia, as a very large archipelagic country, requires a sophisticated surveillance technology that is able to monitor the movement of objects in the territory of Indonesia, either land, sea, or air. One of the technologies that can be used is a radar system. Various radar technologies have been developed, ranging from conventional to modern radar. Recently, a type of modern technology has been proposed which could be a prominent candidate to improve the performance of AESA radar. This technology is called CC-OFDM-MIMO Radar. CC-OFDM-MIMO employs a concept of multibeam radar, but with additional technique of CC-OFDM-MIMO. However, this technology is still in the proof-of-concept stage, so it needs further testing in the prototype form.

This research aims to develop a prototype of CC-OFDM-MIMO Radar that can operate in the frequency of 3 GHz with the maximum range of about 30 Km. To build the prototype of the system, the block diagram of the system is divided into 3 modules, that are antenna module, TRM modules, and signal processing module. For TRM module, it consists of several sub-modules that are IF module, RF Power Amplifier and LNA. IF module is designed to convert the radar signal of 20 MHz to the carrier frequency of 3 GHz. Antenna module and TRM modules are arranged in such a way that the system can produce 7 beams. Signal processing module is designed to generate the radar signal in the transmitter as well as to detect the signal in the receiver. Beside that, Signal processing module has a function to control the TRM module so that it can synchronize between each others.

**Keyword:** cc-ofdm-mimo; digital beamforming; multibeam; radar

## Short Biography



Prasetiyono Hari Mukti was born in Bandung, Indonesia. He received the bachelor degree in Electrical Engineering from Institut Teknologi Bandung (ITB), Bandung, Indonesia, in 2008. Afterwards, he received joint M.Sc degree from Institut Teknologi Bandung (ITB), Bandung, Indonesia, and Delft University of Technology (TU Delft), The Netherlands, in 2012. Moreover, he obtained his PhD degree in Electrical Engineering from Graz University of Technology (TU Graz), Austria in 2022. From 2013, he joined the Department of Electrical Engineering, Institut Teknologi Sepuluh Nopember (ITS), Surabaya, Indonesia as a Faculty Member and since 2023 he is appointed as an Assistant Professor and the Head of Laboratory for Telecommunication Network. During his doctoral study in 2017, he also received Young Scientist Award from URSI. His areas of interest include wireless communication system, radar system, as well as antenna and microwave circuits.