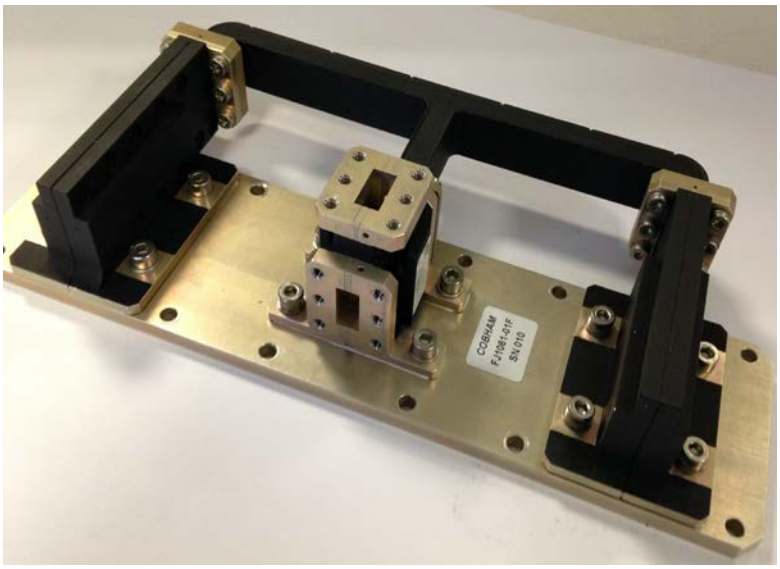
Title:	***"350 WATT KA-BAND ISOLATOR "***		
Contract type	*ARTES 5.1*	**Budget** *(K€)*	
Company (-ies) *(including country)*	Cobham Microwave, France		
Team *(name of the participant in the project)*	- *Léo Farhat* - *Eric Laroche*		
(*) **Speaker (s)**	*Léo Farhat*	**Email**	*Leo.farhat@cobham.com*
Short Speaker Information *(experience and involvement in this project)*	Léo is the technical project manager of this project. He had received a Ph.D. degree in Microwave Physics from Telecom Bretagne, France, in 2010. He joined Cobham Microwave, France, as a Research and Development Engineer, where his development activities concern ferrite devices as circulators, isolators, and loads for space and military applications.		
Summary of the activity *(maximum 400 words)*	The aim of the project is the design, development, manufacturing and test of a Ka-Band high power isolator in WR51 waveguide technology capable to handle 350 Watt CW in both forward and failure modes. Recent advancement in Ka-Band satellite payloads and equipment drive the power level requirements to several hundred Watts per transponder. Travelling Wave Tube Amplifiers (TWTAs) in the 170 to 200 Watt range currently under qualification will soon become available, while the target of future developments is in the 300 Watt class operation. In the Output Multiplexer (OMUX) arena, channel filters for 250 to 500 Watt power handling are also under development. Current classical Y junctions isolators cannot handle more than 150CW W, therefore a novel isolator able to handle high power levels 350 Watt RF power is necessary. This isolator should have an innovative design in order to support the increased power level requested for future payload equipments. The ultimate objective of this project is the design, manufacturing and test of a Ka-Band 350 Watt CW isolator Engineering Model (EM) capable to operate in worst case condition (full reflected power). This work was carried out with technical phases as follows: Phase 1: Technology Review and Breadboards development A Technology review of existing circulators and terminations is done. Full-wave simulations (electromagnetic, thermal, mechanical, etc.) are used to demonstrate compliance with the RF specifications. Breadboards are manufactured, tuned and measured. A high power test is also performed to prove the capacity of the design to handle		

	such high power levels (350CW-W). Phase 2: 350 Watt Ka-Band Isolator Design, Manufacturing and Test Engineering Models are manufactured, assembled and verified. In order to ensure that the EMs meet the specifications, following tests are performed: TVAC-burn-in, mechanical vibrations (sinus, random & sine survey), SRS shock, thermal cycles, power handling in nominal mode (forward mode) and fault case (output port short-circuited), Multipactor test and EMC. All these tests show positive margins. This design, unlike standard designs e.g. classical Y-junction and resonance isolator, is based on an innovative technology in order to reduce the power density travelling in the centre of the junction. The proposed isolators cover the band 17.3-20.2 GHz. The typical electrical performances are less than 0.15dB for insertion loss and higher than 23dB for isolation and for input and output return losses in the operating temperature range (from -20°C to +85°C).  The Design is optimized for a flexible integration in the payloads with minimum volume and mass.

(*) The speaker needs to do the registration through the website