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MAKERSPACES AND CROWDFUNDING FOR ESA SATELLITE COMMUNICATIONS

Abstract

The satellite communications group of ESA is supporting a number of start-ups that intend to deliver new satellite communication services. A considerable number of these companies want to deliver machine-to-machine (M2M) or Internet-of-Things (IoT) services globally with offers that are competitive with regards to terrestrial offers. A number of findings when dealing with these initiatives and companies will be reported upon.

Furthermore, a new instrument to foster innovation is based on **"Makerspaces"** which shall attract the non-typical audience like radio amateurs, hackers, one-person companies, etc. to work on new satellite communication concepts. The MakerSpaces try to establish an attractive environment in which one can prototype new concepts, without the administrative overhead of ESA contracts, and supported by ESA technical knowledge and laboratories. The following MakerSpaces have been initiated or will start soon:

- **M2M/IoT satellite MakerSpace**, for experimenting with novel concepts in the are of IoT in a satellite context.

- **Software Defined Radio (SDR) MakerSpace** for satellite communications, which will allow on ground and in-orbit experimentation with new techniques enabled by SDR.

- A **5G Satellite MakerSpace**, which will act as a agile mechanism for quick prototyping of satellite and terrestrial integration, but also allows the satcom industry to see which concepts from the terrestrial community can be re-used in satellite communications.

Lessons learned from these MakerSpaces will be presented.

The speed of innovation in terrestrial communications is enormous compared to the speed of innovation in satellite communications.

A number of ESA projects try actively to see what can be re-used from those terrestrial developments and adapt those to the satellite environment. Some practical examples of **re-using terrestrial telecommunication innovations** will be given.

Finally, ESA has recently started a project which is supporting a crowdfunding campaign, which would stimulate the development of signal processing algorithms based on open-source SDR boards. The candidate algorithms and general experiences with **crowdfunding** will be presented.