

2.14. MICRO AERIAL VEHICLES AND ROBOTS AS A MEANS FOR NON-DESTRUCTIVE INSPECTION

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Along the enhancing request for homeland security mainly associated with terrorist attack and the increasing drop in cost, size and weight for electronic parts combined with improved performances of those parts as well as wireless data transmission and computation performance, micro aerial vehicles (MAV) can be realised those days at very affordable cost. Those air vehicles with a span down to 30 cm, which can be designed as fixed, rotary or flapping wing systems, can be combined with cameras at a weight of a few grams only, that allow pictures to be transmitted to a ground station in real time and where the air vehicle can even fly autonomously through a controller being pre-programmed on the ground before start. Vehicles of such a character can be ideal to inspect damage on buildings or infrastructure in general being difficult to inspect such as tall buildings, bridges, rocks, etc., and to avoid inspectors to access those locations under the risk of their life.

The presentation will first address the background of micro aerial vehicles (MAV) with regard to their concept, design and performance. This will then be followed with some examples on flight performance including a camera on-board. Discussion will centre around the pictures being obtained and how to get those processed such that a suitable information for condition monitoring can be obtained. This discussion will be added with regard to a modular design that might even include small robotic crawling systems to further move into remote areas for monitoring. Conclusions will then be drawn from such an MAV concept with regard to non-destructive inspection.