

SYMPOSIUM ON INTEGRATED APPLICATIONS (B5)
Tools and Technology in support of Integrated Applications (2)

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INTEGRATED SPACE TECHNOLOGY ON SMALL AIRCRAFT FOR INSTANT SITUATIONAL
AWARENESS IN DISASTER SITUATIONS**Abstract**

Disaster and emergency management authorities are facing a growing number of events (such as various kinds of floods and storms, wildfires, earthquakes, volcanic activity, mudslides, avalanches, dam failure, industrial accidents) that require instant response to save lives, limit damage and restore affected infrastructure. Effective response during the first hours is crucial but often hindered by a lack of current situational awareness information, combined with impaired accessibility of the affected location on the ground. Space technology can empower response forces and their commanders with better, quicker assessment for optimised use of their available resources. Satellite imagery is already being made available through various initiatives. In the European Space Agency's Integrated Applications Programme (IAP), the project SASISA (Small-Aircraft Service for Instant Situational Awareness) investigates and validates a significant, additional new element that draws on three space technologies (satellite communication, remote sensing and navigation) in combination with terrestrial (airborne) technologies. While aerial reconnaissance in disasters is widely practised, it is not yet pursued as an integrated activity. Communication between the situation centre and the aircraft, if it exists, is limited to voice. Sensor data are usually only processed offline after the mission and so-called 'rapid mapping' products may take days to arrive. Furthermore, live video downlinks depend on the prior establishment of functioning line-of-sight radio links in the (devastated) zone of operations. Direct digital sensor data transmission from aircraft via satellite is rarely used in the civil sector. Finally, the high operational cost of near-broadband data streaming via satellite in the existing L-band network has put this approach beyond the reach of most public security agencies. SASISA shows that the availability of compact Ku-band (and soon Ka-band) terminals which can now be integrated in small affordable multipurpose aircraft such as the Diamond DA42MPP reduces operational costs significantly and permits models of service provision that are feasible and attractive for public-sector users and at the same time constitute a viable business for aircraft operators and service integrators. This ability to directly provide frequent high-resolution still images and/or streaming video via IP over satellite to operations command centres at any distance beyond the line of sight opens up new opportunities for integrated geo-information processing in near-real time with interfaces to the users' own GIS infrastructure as well as their situational awareness, visualisation and

mission command systems. SASISA aims at demonstrating the utility of such an integrated, modular and adaptive service to public-sector users across Europe.